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PUBLIC HEALTH ACT,

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R E P O R T

TO THE

GENERAL BOARD OF HEALTH,

ON A

PRELIMINARY INQUIRY

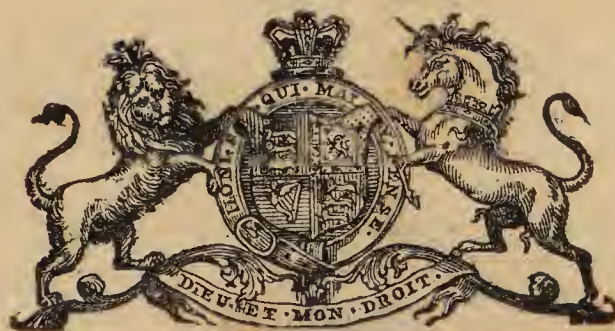
**INTO THE SEWERAGE, DRAINAGE, AND SUPPLY OF
WATER, AND THE SANITARY CONDITION
OF THE INHABITANTS,**

OF THE CITY OF

C A R L I S L E,

IN THE COUNTY OF CUMBERLAND.

By ROBERT RAWLINSON, Esq., C.E.,
SUPERINTENDING INSPECTOR.



LONDON:

**PRINTED BY W. CLOWES & SONS, STAMFORD STREET,
FOR HER MAJESTY'S STATIONERY OFFICE.**

1850.

NOTIFICATION.

THE General Board of Health hereby give notice, in terms of section 9th of the Public Health Act, that on or before the 20th July next, written statements may be forwarded to the Board with respect to any matter contained in or omitted from the accompanying Report on the Sewerage, Drainage, and Supply of Water, and the Sanitary Condition of the Inhabitants of the City of CARLISLE, or with respect to any amendment to be proposed therein.

By order of the Board.

HENRY AUSTIN, *Secretary.*

Gwydyr House, Whitehall,
17th June 1850.

Note to Binder.

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PUBLIC HEALTH ACT (11 and 12 Vict., Cap. 63).

Report to the General Board of Health, on a Preliminary Inquiry into the Sewerage, Drainage, and Supply of Water, and the Sanitary Condition of the Inhabitants of the City of CARLISLE, in the County of Cumberland. By ROBERT RAWLINSON, Esq., Civil Engineer, Superintending Inspector.

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REPORT.

MY LORDS AND GENTLEMEN,

June 1850.

IN consequence of a petition forwarded to your Honourable Board from the mayor, aldermen, and citizens of the city of Carlisle “in council assembled,” and also of a petition from upwards of one-tenth of the inhabitants rated to the relief of the poor, due notice was given as the Act directs, that an inquiry should take place on the 7th day of November 1849, at the Town Hall, Carlisle. In accordance with instructions I commenced an inquiry; and from the evidence received, and also from a personal inspection of the city and district, I have drawn up the accompanying Report, which, with the remarks, suggestions, and recommendations appended, I respectfully beg to submit for consideration.

As the preamble of the petition is a summary of the requirements of the citizens, I beg to embody it:—

“The HUMBLE PETITION of the MAYOR, ALDERMEN, and CITIZENS of the City of CARLISLE in Council assembled,

“SHOWETH,

“THAT the city of Carlisle contains 23,959 inhabitants, and is governed under the provisions of the Municipal Corporation Act by a mayor, aldermen, and council.

“That the number of inhabitants of the said city rated to the relief of the poor is 4,607.

“That beyond the ancient limits of the said city large suburbs have arisen, in which (but within the present limits thereof as extended by the Municipal Corporation Act, as well as within the ancient boundaries of the City itself) are many narrow streets, lanes, and courts, over which your petitioners have no control in the way of enforcing cleanliness or the erection of privies and other conveniences, except such as has been granted by the recent Act for the removal of nuisances.

“That your petitioners possess no power for the removal of slaughter-houses, which are found to be a great nuisance within the city, nor for the erection of others in convenient situations.

“That many parts of the city and suburbs are either improperly sewered, or not sewered at all.

“That the returns of the Registrar-General show, that the number of deaths within a period of seven years from 1841 has amounted to an average yearly mortality of 29 in each thousand inhabitants, taking the population as it stood at the last census in 1841.

“That the only burial-grounds within the ancient limits of the city are and have been for a very great number of years the church-yards attached to the parish churches of St. Mary and St. Cuthbert, and these are now crowded to an extent offensive to the sight, and it is believed most injurious to the inhabitants of the neighbourhood where they are situated, being nearly in the centre of the city.

“That about 20 years ago, two new churches or chapels of ease, with small burial-grounds attached, were erected and provided in the suburbs called Botchergate and Caldewgate; but these burial-grounds are being rapidly filled up, and at the present rate of mortality must soon cease to afford the required accommodation.

“That power is required for providing proper cemeteries or burial-grounds for the decent interment of the dead, and the prevention of disease amongst the living.

“That in the opinion of your petitioners, many of the evils here pointed out, and others, might be remedied or removed under the powers contained in the Public Health Act, 1848.

“Your petitioners therefore humbly pray, that your Honourable Board will direct a superintending inspector to visit the city of Carlisle, and take such other steps as may be necessary for extending to the said city the powers and authorities of the said Act with as little delay as may be consistent with due inquiry and proper consideration.

“And your petitioners will ever pray, &c.

“By Order of the Council of the said city,

“The Corporate Seal attached, and

“(Signed) GEORGE DIXON, *Mayor.*”

The preamble of the petition from the rate-payers is so far as may be a duplicate of the foregoing, and is signed by 676 persons, all being rate-payers.

INQUIRY.

The inquiry took place at the Town Hall; a majority of the magistrates who usually sit upon the borough bench were

in attendance, as also the greater part of the members of the council; amongst others, the gentlemen hereunder named were present, or, during the inquiry, gave me their assistance and support:—

“ George Dixon, Esq., Mayor; John Dixon, Esq., J. P. and Alderman; James Steel, Esq., Alderman; John Fawcett, Esq., Barrister and City Justice; Robert Cowen, Esq., C.E., County Justice and Councillor; Silas Saul, Esq., Solicitor and Chapter Clerk; Mr. William Richardson, Alderman; Mr. Thomas Nelson, Councillor; Mr. John Irving, Councillor; Mr. Joseph Rome, Councillor; Mr. John Pattinson, Councillor; Mr. Robert Simpson, Councillor; P. J. Dixon, Esq., Alderman; Mr. Isaac Cartmell, City Treasurer; Mr. George Robinson, Councillor; Mr. Joseph Iredale, Councillor; Mr. Joseph Richardson, Alderman; Mr. Joseph Hope, Councillor; Robert Perring, Esq.; Geo. Mounsey, Jun., Esq., Solicitor, Clerk to Board of Guardians; H. J. Halton, Esq., Solicitor; John Howe, Esq., Solicitor; Mr. T. Sheffield; Thomas Barnes, Esq., M.D., F.R.S.E., Physician to the Infirmary, House of Recovery, Dispensary, Fever Hospital, &c.; Henry Lonsdale, Esq., M.D., Physician to the Cumberland Infirmary; Samuel Knott, Esq., M.D.; Mr. Peter Linton, Medical Officer to Carlisle Union; Robert Bendle, Esq., Solicitor, Alderman; T. T. Railton, Esq.; Mr. James Fleming, grocer; William Jackson, Esq., Solicitor; Mr. James Stewart, Architect, Inspector of Corporation buildings, and Town Surveyor; John Nanson, Esq., Solicitor and Town Clerk; Captain William Godfrey Clark Monins; Mr. John Brown, Councillor; Robert Elliott, Esq., M.D.; Mr. Ellwood Brockbank, Councillor; Mr. George Porter, iron-founder; Mr. Mortimer, Surgeon; Mr. Caleb Hodgson, Councillor; Mr. McAlpin, Solicitor; Mr. Cannell, Councillor; Mr. W. R. Martindale, Councillor; Mr. Rowland, and others.

In no other place have I received more assistance than in Carlisle; one wish seemed to pervade all parties, namely, that the necessary power should be obtained as speedily as possible to enable the corporation to improve the sanitary condition of the citizens, and thereby increase the health and comforts of all classes; but especially of the labouring man. A Committee had been formed out of the council to prepare information for the inquiry, and to give every assistance required. On the motion of Mr. Steel, the following gentlemen had been nominated upon that Committee:—For Rickergate, Mr. Bendle and Mr. Hope; for English-street, Mr. Richardson and Mr. Steel; for Botchergate, Mr. Iredale and Mr. Joseph Richardson; for Caldewgate, Mr. Richard Pattinson and Mr. Robert Simpson; and for St. Mary's, Mr. Rome and Mr. Robinson.

Mr. Steel handed in the several papers and returns which had been prepared.

In company with the mayor and other gentlemen, I made a full inspection of the district, especially with reference to the proposed line of outfall for the sewage, which for reasons hereafter given I conceive must be from the city towards the pumping engine used by the proprietors of the canal.

EARLY HISTORY OF THE CITY.

CARLISLE.—An ancient city, parliamentary and municipal borough, the county town of Cumberland and the see of a bishop, 260 miles north-west by north from London direct distance, or 305 by the rail-road. The site of this city is said to have been occupied by a town, and to have been inhabited by the ancient Britons as a place of considerable importance before the Roman invasion. In the early periods of history, *Llu-gyda-gwal*, which may be interpreted the *Army by the Wall*, is associated with swamps, barren heaths, and dense forests. The warriors of Imperial Rome took possession of the old city of the Celts, named it *Lugovallium*, or *Luguballum*, and afterwards made it one of their strongest towns in Britain, standing as it did near the vallum of Hadrian. The Saxons abbreviated *Luguvallum* to "*Luell*," prefixing the word *caer*, their name for city; the two became *Caer-Luell*, whence is derived the present name Carlisle.* The border situation of the old city has, according to the earliest records of history, subjected it to repeated hostile attacks. The Roman trampled down the rude defences and dwellings of the Celt; during their temporary absence in the reign of the Emperor Nero, the place was burned by the Picts and Scots. In about the year 876, Carlisle was destroyed by the Danes, and for two centuries remained a place of desolation and ruins;† rank vegetation covered streets, walls, and towers; forest-trees grew to maturity amidst the fallen masonry. William the Conqueror in 1072 ordered it to be rebuilt and fortified; in 1092, William Rufus, on his return from Scotland, noticing its beautiful situation, and perceiving its great importance as a frontier town, resolved on having the rebuilding completed. A colony of Flemings, who had been here about this time, were soon afterwards replaced by a colony of South Britons, who reclaimed portions of the wild forest of Inglewood, and taught the natives how to till and cultivate the naturally rich and fertile plains round Carlisle. Henry the First completed what Rufus had left unfinished, and erected Carlisle into an episcopal see, April 11, anno 1132, making Athelwold, his confessor, first bishop of Carlisle. From this time, down to 1745, the glorious old city witnessed many scenes of pomp and change. Kings, princes, and potentates, mailed warriors, and mitred churchmen, have visited and

* There are several other definitions as to the derivation of the name of the city.

† "When they had laid waste Northumberland, their violence was suffered to proceed so far as this city, and lay it in utter ruin; burning the town, throwing down the walls, and killing man, woman, and child, the inhabitants being then very numerous. In that state it was left for 200 years without an inhabitant, but some few Irish, who lodged themselves among the ruins. The very foundations of the city were so buried in the earth, that it is said large oaks grew upon them."—*Dr. Todd's MS.*

PLAN OF THE BOROUGH OF CARLISLE

Showing the Parliamentary Boundary which is proposed
as the Boundary for the purposes of the Public Health Act:-
thus -----

NB The extreme rise of the River Eden
from the lowest state to a great flood
is about 20 Feet. The Caldew and
Petterill are also liable to excessive
floods.



POPULATION AS TAKEN IN 1841.

S. Mary's	4626
Hebbergate	2379
Caldewgate	5533
S. Anthbert's Within	3766
S. Anthbert's Without	6296
Public Institutions	288
Total	21879

Out Townships.

Blackwell High	374
Blackwell Low	200
Blithby	130
Brace	350
Carlisle	200
Upperby	602
Harroby	75
Wray	200
Total	2081
Total with Out Townships	23959

PRESENT POPULATION ABOUT 27,000.

REFERENCES.

- A Cathedral
- B Town Hall
- C S. Anthbert's Church
- D Gaol
- E Court House
- F Christ Church
- G Independent Chapel
- H Athenaeum
- I Methodist Tabernacle
- K Scotch Church
- L Catholic Chapel
- M Quakers Meeting House
- N Methodist Chapel
- O Presbyterian Chapel
- P Quakers Burying Ground
- Q Baptist Chapel
- R Trinity Church

SCALE.

10 20 30 Chains

resided within its walls. It has been the temporary seat of Parliament, and the frequent battle-ground of contending armies; siege, fire, and sword, royal pageantry, and pompous show have had alternate sway. With the first Edward, "merry Carlisle" was a favourite place of temporary residence, where he came to relax from his Scottish wars and enjoy the chase in the neighbouring forest of Inglewood, in which he is said to have slain 200 bucks in a few days.

The city was considered old, decayed, and ruinous in the reign of Henry VIII., as Leland, in his Itinerary, thus describes it:—

"In the wall be iii gates, Bocher (south) gate, Caldew (west) gate, and Richard (north) gate. The castle being within the town, is yn sum part as a closer of the wall.

"The hole site of the towne is sore chaungid. For whereas the stretes were, and great edifices, now be vacant and garden plottes. The cite of Cairluel stondeth in the forest of Ynglewood. The cite ys yn compase scant a myle, and ys walled with a right fayre and stronge wal, *ex lapide quadrato subrufo*. In diggyng to make new buildyngs yn the towne, often tymes hath bene, and now alate fownd diverse foundations of the old cite, as pavimentes of stretes, old arches of dōres, coyne, stones squared, paynted pottes, mony hid yn pottes, so hold and mauldid, that when yt was strongly touchid yt went almost to mowlder."

And further, he states that—

"In the feldes about Caerluel, yn plewhyng hath be fownd diverse Cornelines, and other stonys wel entaylid for seals, and yn other places of Cumberland yn plewhyng hath be fownde bricke conteynyng the prints of antique workes."

Camden also visited Carlisle; his description of the site and city is as follows:—

"Between the confluence of these rivers (Peteril and Cauda) the ancient city of Carlisle has a delightful pleasant situation; bounded on the north with Eden, on the east with Peteril, and on the west with Cauda, and, besides these natural fences, it is fortified with a strong stone wall, a castle and citadel. It is of an oblong form from west to east; to the west is a pretty large castle, which was built by William II. and repaired by Richard III., as should seem by the arms."

In the eventful history of the city, plague has at times raged so formidably, and swept away such multitudes, that the living were scarcely sufficient to bury the dead; so that the sword, fire, and plague, have heaped desolation upon desolation, until the present city stands upon piled ruins. Ancient walls, pavements, floors, grave-yards, and coins, are found beneath the present surface at varying depths of 5, 10, 15, and 30 feet. The whole sub-soil is one mass of ruins, locally known by the name of "forced earth." This rapid sketch of the past history of the place, with a knowledge of the character of the sub-soil, will not be without its use in carrying out the new works,

to accomplish which the entire site must be pierced with a network of sewers and drains.*

The modern city of Carlisle has been much improved of late years; the old city walls have been thrown down; manufactures have been extended, public buildings have been erected, roads have been improved, streets have been re-formed and paved, land has been judiciously laid out in the suburbs, water-works have been established; and with proper sewers and drains, systematic regulating and cleansing, the wise, benevolent, and philanthropic citizens will see the physical condition of the working man improved, his comforts increased; and, his moral character raised.

Sanitary works are essentially works of economy, and they are enemies to man and to society who make them otherwise. It may serve the temporary purpose of ignorant malice to represent them as ruinously expensive and oppressive; and men may even be found who wilfully distort every statement made relative to works of improvement, but as in all other things untrue, this can only have a temporary effect.

ANCIENT FORM OF GOVERNMENT.

It does not appear when the first incorporation of the burgesses took place, or what was the original constitution. By the recitals of a grant made by Edward III., it seems that preceding it, and even from time immemorial, the city had been governed by a mayor, bailiffs, and coroners; but when this body politic had its commencement there is no evidence to prove.

The city has had many Royal grants and great privileges; the first named is one of Henry II.; this was burned in an attack made by the Scots: it is recited and confirmed by the charter of Henry III. By this charter the citizens were exempted from the payment of toll, passage, pontage, and all customs belonging to the King; with the privilege granted of having wood for fuel and for their erections within the forest of Carlisle. Subsequently great part of the city suffered by accidental fire, and the records were a second time destroyed. Edward I., in the 21st year of his reign, by charter, dated the 23rd day of June, recites the grant of Henry III. from the in-rollment of it in his Chancery, and stating that it had been lost by fire, confirmed it verbatim. Edward III. also secured to the burgesses their privileges by charter. Richard II., in the fifth year of his reign, also granted the citizens a confirmatory charter. The rights and privileges of the city were con-

* In constructing the proposed sewers and drains, the Corporation may probably add considerably to the interesting collection in their Museum, if they issue orders to the superintendants of the work, to claim all remains of antiquity discovered, as the property of the Corporation.

firmed by several charters of Henry VII., third year of his reign; Henry VIII., first; Edward VI., fifth; Queen Elizabeth; and James I., second. Charles I., in the 13th year of his reign, confirmed the preceding grants or privileges, reforming only the election of mayors, bailiffs, and coroners: this body corporate then consisting of a mayor, 11 aldermen, 2 bailiffs, 2 coroners, and 24 capital citizens or common council. The city has returned members to Parliament since the reign of Edward I. The present members are P. H. Howard, Esq., and W. N. Hodgson, Esq. In the reign of Henry VI. assizes began to be held in the city of Carlisle for the county of Cumberland, by virtue of an especial Act made in the 14th year of that King.

PRESENT MUNICIPAL GOVERNMENT—In 1835, under the powers of the Act for the “Regulation of Municipal Corporations in England and Wales,” the old Corporation of the city was dissolved, and a new body was established, which consists of 10 aldermen and 30 councillors. The body corporate is styled the mayor, aldermen, and citizens of the city of Carlisle. The city is divided into five wards, the citizens or *burgesses* of each ward electing six councillors, who retain office for three years, but are eligible to be re-elected. The aldermen were formerly chosen out of the wealthier classes of citizens, and the mayor and two senior aldermen were *ex-officio* justices of the peace. They are now appointed by the councillors; and during their appointment, which is six years, they are members of the Council, possessing no power or authority above the councillors. The justices of the peace now act under a commission from the Crown, and are a distinct body from the aldermen.

The city of Carlisle, as the limits were defined by the Municipal Corporation Act, now includes the township of Botchardgate and St. Cuthbert's Within, both in the parish of St. Cuthbert; the township of Rickergate and part of the township of Caldewgate, in the parish of St. Mary, and the township of St. Mary's Within.

THE CORPORATION consists of Mayor, 10 aldermen, 30 councillors, 2 auditors, 5 assessors, and 2 revising assessors, chosen annually from the burgesses.

Permanent Salaried Officers.—John Nanson, solicitor, Town Clerk; Isaac Cartmell, Treasurer; John Wales, John Sabbage, John Banfather, and John Cowen, Sergeants-at-Mace.

CONSISTORY COURT OF THE DIOCESE.—Sits Monthly in the Cathedral. Judge—The Venerable and Reverend William Jackson, D.D., Chancellor of the Diocese of Carlisle. Registrar—G. G. Mounsey, Carlisle. Proctors—Messrs. William Dobinson, Silas Saul, Thomas Houghton Hodgson, John Nanson, George Mounsey. Apparitor—Mr. George Mason.

MECHANICS' INSTITUTE, ATHENÆUM, LOWTHER-STREET.—Library open from seven to nine o'clock every evening, except Sundays.

MUSEUM, ATHENÆUM, LOWTHER-STREET.—Admission gratis from ten till four every day, except Sundays.

MARKETS AND FAIRS.—The market days are Wednesday and Saturday. Fairs for the sale of cattle and hiring of servants are held on the nearest Saturdays to Whitsuntide and Martinmas. Fairs are also held on the 26th of August, and continue a fortnight; and on the 19th of September. During these two latter fairs all persons are free from executions issued by the borough court. A series of fairs, or "great marts," for horses and cattle, commence on the Saturday after the 10th of October, and continue till Christmas.*

TABLE OF POPULATION.

Mr. Steel put in a copy of the census, and remarked—

"You will find discrepancies in the returns which only local knowledge can enable you to correct. They arise principally from the fact, that in the returns for Carlisle there are out-townships included—such as Blackwell, Botcherby, Briscoe, and so forth. The recommendation of the Committee is, that you should not include these places in the application of the Act to the city, but that the application of the Public Health Act should be confined within the boundaries of the municipal borough, over the whole of which the Corporation has jurisdiction."

Census as taken in 1841.—(Parliamentary Boundary.)

St. Mary's . . .	4,626
Rickergate . . .	2,379
Caldewgate . . .	5,533
St. Cuthbert's Within .	3,756
St. Cuthbert's Without .	5,296
Public Institutions .	288
	———— 21,898

Out Townships.

Blackwell, High . . .	324
Blackwell, Low . . .	200
Botcherby . . .	130
Briscoe . . .	350
Carleton . . .	200
Upperby . . .	602
Harraby . . .	75
Wreay . . .	200
	—— 2,081
	———— 23,959

* At the time these fairs are held the city is crowded, not only with those who come for purposes of legitimate commerce and trade, but also with hawkers, vagrants, and other persons of loose character. The number of fairs, &c., may account for the excess of public-houses and spirit vaults shown to exist.

LIST OF LOCAL ACTS IN FORCE IN THE CITY OF CARLISLE.—
44 Geo. III., cap. 58, Sess. 1803-4—An Act for lighting the streets, lanes, and other public passages and places within the city of Carlisle, in the county of Cumberland, and the suburbs of the said city; *for paving the footpaths of the streets of the said city and suburbs*, and for otherwise improving the said city.

Remarks.—Sections 54 and 55, relating to paving the footpaths of the streets, appear to be unnecessary if the Public Health Act is put in force, and might therefore be repealed.

7 and 8 Geo. IV., Sess. 1826-7—An Act for watching, regulating, and improving the city of Carlisle and the suburbs thereof.

Remarks.—It does not appear necessary to repeal any of the provisions of this Act.

Mr. Steel stated in evidence—

“With respect to local Acts, we have only one local Act of Parliament. It relates to the lighting and paving of the town, or, rather, the flagging of the footpaths. The old Act for watching, regulating, and improving the city was done away with by the Municipal Reform Act, which, of course, includes regulations for watching the town. The paving of the streets, within the ancient limits of the city, is executed by the Corporation. In the out-townships it is done by trustees of roads and road surveyors, by local rate. In connexion with the sanitary condition of the town, I furnish you with the last reports of the Infirmary and of the Dispensary. Here also is a list of 16 slaughter-houses, all within the borough, and to which the Committee wish to direct your particular attention, as being complained of as great nuisances. They recommend that they should be removed.”

Abstract of the Receipts and Expenditure of the Council of the City of Carlisle, from 1st September, 1848, to 1st September, 1849.

Dr.

Isaac Cartmell, Treasurer, in Account with the Mayor, Aldermen, and Citizens of the City of Carlisle, from 1st September, 1848, to 1st September, 1849.

Cr.

	£.	s.	d.	£.	s.	d.		£.	s.	d.	£.	s.	d.
To Arrears in Butcher Market	.	..					By Balance due Treasurer last Account	.			2,479	2	7
To Rents, Tolls, &c.:—				0	6	0	By Police and Watching:—	.					
Tolls and Stallage	.	484	13	8			Clerk's Salary	.	40	0	0		
Arrears from Lancaster and Carlisle Railway	.	152	13	6			Superintendent	.	88	8	0		
Lands, &c.	.	679	3	3			Sergeants	.	104	0	0		
Houses, Shops, &c.	.	267	6	0			Day and Night Constables	.	808	18	2		
Shambles, &c.	.	359	6	3									
Ground Rents	.	130	13	5			Deduct cash received from Canal Company for watching Premises.	.	1,041	6	2		
Arrears from Gas Company	.	91	14	9					20	16	0		
Leasehold Rents	.	3	8	0									
Annual Acknowledgement	.	7	11	8			Taxes and Insurance	.	1,020	10	0		
Free Rents	.	1	5	6			Printing and Stationery	.	3	12	3		
Kingmoor Rents	.	0	10	6			Articles for Constables	.	12	8	5		
Cullery Rents	.	8	0	11			Clothing	.	11	14	3		
To Miscellaneous Receipts:—					2,186	7	5						
Penalties, Fees, &c.	.	£29	3	6			Coals, Coke, and Gas	.	54	18	2		
Gas Debentures	.	43	0	0			Painting, &c.	.	27	3	3		
Scotch-street Drain	.	12	11	1			Repairs of Premises	.	4	19	9		
Aglionby Lands Drain	.	3	15	0			Incidental Expenses	.	27	16	7		
Interest on Purchase Money to date of Payment	.	382	17	8			Gas for Fish Market	.	21	1	2		
Pork Market	.								5	3	3		
Less Expenses	.						By Cleaning and Watering Streets:—				1,189	7	3
							Water Company for Water	.	43	15	0		
							Scavengers and Water Cart	.	249	17	8		
							Less sale of Manure	.	293	12	8		
To Property sold	.								80	10	0		
							By Miscellaneous Accounts:—				213	2	8
							Fixed Charges	.	39	1	2		
							Taxes and Rates	.	36	13	1		
							Insurance	.	1	7	6		
							Interest and Commission	.	141	0	9		
							Carried forward	.	218	2	6		
											3,881	12	6

Dr.			Isaac Cartmell, Treasurer, in Account with the Mayor, Aldermen, and Citizens of the City of Carlisle, &c.—continued.			Cr.		
			£.	s.	d.	£.	s.	d.
Brought forward						218	2	6
						23	0	0
						21	8	2
						17	5	6
						154	5	10
						22	17	10
						44	11	3
						236	14	3
						4	10	4
						47	10	9
						89	5	10
						40	18	8
						8	2	10
						928 13 9		
						0	4	8
						7	13	6
						13	14	2
						0	6	0
						0	1	0
						21 19 4		
						80	0	0
						50	0	0
						20	0	0
						11	0	0
						5	0	0
						7	4	0
						2	12	0
						0	7	6
						0	7	6
						176 11 0		
						20 5 0		
						£5,029 1 7		

Abstract of the Receipts and Expenditure of the Council of the City of New York, from July, 1848, to July, 1849.

RECEIPTS.			EXPENDITURE.		
	£.	s. d.		£.	s. d.
Balance in the hands of the Treasurer on settling last Year's Accounts . . .	..	..	Gas Company for Gas	912	0 10
Amount of Rate made 10th Oct., 1848, at 6d. in the pound :—			Gas Company for Fittings	7	5 7
Abbey-street Quarter . . .	47	17 6	Printing and Stationery . . .	2	7 6
Castle-street do. . .	77	1 2½	Flagging . . .	26	15 11
Fisher-street do. . .	47	16 2	Clerk's Salary . . .	21	0 0
Botchergate do. . .	215	2 8½	Incidentals . . .	3	18 0
Rickergate do. . .	118	2 1½	Balance . . .	128	1 10
Scotch-street do. . .	130	2 10			
English-street do. . .	233	7 8			
Caldewgate do. . .	144	5 10			
Amount of Rate returned Empty and Irrecoverable :—		1,013 16 0½			
Abbey-street Quarter . . .	4	4 5½			
Castle-street do. . .	1	16 2½			
Fisher-street do. . .	0	14 8			
Botchergate do. . .	8	6 4			
Rickergate do. . .	4	14 6½			
Scotch-street do. . .	2	19 0			
English-street do. . .	10	6 4½			
Caldewgate do. . .	8	3 8½			
Collector's Poundage . . .	24	6 3			
By Interest . . .	..	..	
		65 11 6½		948	4 6
				8	9 8
				1,101	9 8

Examined and found correct,
(Signed) { GEO. DIXON,
J. BROWN, }

(Signed)

Auditors.

{
JOS. FORSTER,
W. RICHARDSON,
JOS. HANNAH,
}

NOTE.—There is no borough rate since the transfer of the Commissioners' powers to the Corporation. The corporate estate pays the whole expenditure, except for lighting the lamps.

GEOLOGY.—The city of Carlisle stands on the new red sandstone formation; the upper portion of the saliferous system; in order, immediately below the oolites, and overlaying the carboniferous system. The new red sandstone is composed principally of sandstone rock, of a red, yellow, or brownish colour; although beds of great thickness and wide area are found of a cream colour, or approaching to white. The beds of sand-rock alternate with variegated beds of marl and clay. Stone from this formation is very extensively used for building purposes throughout the kingdom, though much of it is comparatively worthless for architectural purposes. And many old buildings which would have exhibited great beauty, had good stone been used, are now, though still erect, little more than piles of ruins. The geological character of a stone ought to be intimately studied by the architect, as much may be gained by the mode of using even that obtained from this formation.

The whole mass of the new red sandstone is the *débris* of older formations; the quartz, mica, and felspar of the granites have been disintegrated by damp, frost, sun, air, and vegetation, each acting independently, as also variously combined; streams and rivers have borne the loosened grains into the ocean, there to be re-spread out, and re-consolidated into rock; which a renewed action of gravitation has again caused to become dry land. The sand composing this rock, has been spread out in thin layers, over wide areas, like sheets of paper laid one upon the other, so that the rock is formed in “beds,” and it is found that if the bed is cut through vertically, or at right angles to the plane of cleavage, and the edge of the stone is alone exposed when used for building, it will endure for many centuries; but if the bed is set outwards, or exposed, the stone scales and wastes by a gradual falling away of those several laminæ of which it is composed.

In examining the new red sandstone formation, many highly interesting geological phenomena, of periods and times long passed, present themselves; the rocks in some districts exhibit all the characteristics of having been deposited and formed in deep water; in other districts of having composed and constituted the shore of some ocean, sea, or estuary. Where thin veins of clay have intervened betwixt beds of rock, the drying action of the sun, and even the impression of rain, is distinctly visible, and those curious and highly interesting footsteps of the chirotherium, and other strange reptiles are found; as in Cheshire, near Dumfries, in Hepsberg, in North America, and at other places. They have left the impress of their tread over clay-covered sand, which has proved more enduring than monumental granite or brass. Although it is said that Carlisle stands upon this formation,

it is not implied that the rock is in all places visible at the surface, as this is not the case; beds of peat, clay, marl, sand, and gravel, from a few feet to many feet in vertical thickness, may intervene. This superficial covering of the more regular strata is termed alluvial. Excepting in some parts of the bed of the river, the whole valley of the Eden has such a covering. It will be partially through this irregular deposit that the drains and sewers of the city will have to be formed, and therefore it is not probable that any difficulty will have to be encountered.

Many of the large towns in England stand upon the new red sandstone; such is the case with Liverpool, Manchester, and Birmingham, as also with many of a secondary importance in Lancashire and Staffordshire.

METEOROLOGY.—The following abstract was laid before me by Thomas Barnes, Esq., M.D., a gentleman who has laboured to benefit Carlisle, not less by his scientific knowledge than by his indefatigable labours in attending the Infirmary,—Dispensary,—House of Recovery, &c. The meteorological journal has not been continued down to the present time, but the following table of rain-fall will show that it has been extended over a sufficient number of years to give reliable averages.

<i>Table of Rain-fall as recorded by the Rev. William Rees.</i>				<i>Observations by Dr. Barnes.</i>			
Inches.				Inches.			
Total quantity of rain-fall in Car- lisle in the years	1845	. .	27 $\frac{1}{2}$	. . .	1801	. .	31·466
	1846	. .	32 $\frac{1}{4}$	. . .	1802	. .	28·504
	1847	. .	24 $\frac{2}{10}$	. . .	1803	. .	27·520
	1848	. .	31 $\frac{7}{10}$	. . .	1804	. .	35·845
To November 10th 1849	. .		23 $\frac{7}{10}$	. . .	1805	. .	26·355

It will be seen from this table, as compared with those given by Dr. Barnes, that the rain-fall of the last five years agrees very nearly with the first 24 years of the present century, the first five years of which are contrasted with the results of Mr. Rees' observations. The remarks and inferences made and deduced are also valuable.*

“*Meteorological Results.*—From the late Mr. Pitt's observations, by Thomas Barnes, M.D.—The results of the meteorological journals for 24 years, I have arranged into the subsequent tables. To Mr. Taylor of Carlisle, I beg to express my obligation for his kind assistance in calculating some of the averages. Should the journal and the tables be found useful in promoting the advancement of the science of meteorology, I shall feel highly gratified, by having contributed my mite to so desirable an object.

* The rain-gauge was a copper vessel, consisting of a funnel inserted into a tube, with a narrow communication to prevent evaporation. It was placed in an open situation upon a garden-wall, about 12 feet above the surrounding ground.

"It is not improbable that these meteorological journals might be made useful and valuable, by comparing them with similar journals kept at the same time by other observers, at different and distant places. They would show the agreement and difference of atmospheric phenomena in different regions of the earth; and perhaps important conclusions may be drawn from their comparison. As I have had few opportunities of examining journals of this kind, I shall not offer any opinion respecting them, neither shall I at present attempt to draw any conclusions from the comparisons I have made. I shall merely observe, that I have met with some instances of remarkable simultaneous fluctuations of the barometer, occurring in places at a considerable distance from one another. Among them, the following may be mentioned. On the 30th of November 1816, the barometer at Carlisle stood uncommonly high. According to the register, it was as high as 30·77, morning; 30·77, afternoon; and 30·80, night,—wind north-west. On the same day at Edinburgh, there was the greatest elevation of the barometer that had been observed for several years. The mercury, 135 feet above the level of the sea, stood at 30·640 in the morning, and 30·602 in the evening,—wind west.* On the night of the 4th of March 1818, the barometer at Carlisle was unusually low. It was as low as 28·24; the following morning 28·43; in the afternoon 28·60; and at night, 28·81,—wind south-west. The weather had been very stormy, with violent hurricanes, and heavy showers of hail and snow for several days. A hurricane occurred during that night. At Edinburgh, there was similar weather, with hurricanes; and on the 5th March, at eight o'clock of the morning, the barometer stood at 27·970,—wind south-west. This was the greatest depression of the barometer that had been observed there for many years.† On the 8th and 9th of January 1820, the barometer stood extremely high at Carlisle, and also at London. At Carlisle, on the morning of the 8th, it stood at 30·74; in the afternoon, 30·80; and at night, 30·87. The following morning, 30·94; afternoon, 30·86; night, 30·75. At London,‡ on the morning of the 8th of January, the barometer was at 30·42; in the afternoon, 30·44; at night, 30·52. On the morning of the 9th, 30·59; afternoon, 30·51; night, 30·32. The mercury had risen at Carlisle, at the afternoon observation of the 8th $\frac{2}{100}$ ths of an inch; and at night $\frac{7}{100}$ ths more. At London, it had risen $\frac{2}{100}$ ths in the afternoon, and $\frac{8}{100}$ ths more at night. It rose exactly $\frac{7}{100}$ ths of an inch during the night of the 8th at both places; and fell $\frac{8}{100}$ ths of an inch at both places in the forenoon, which are striking coincidences. The barometer had fallen $\frac{1}{100}$ ths of an inch at the night observation at Carlisle, and $\frac{19}{100}$ ths of an inch during the same time at London;—wind north-east, on both days, at both places. The extraordinary height of 30·94, which the barometer attained on the morning of the 9th of January 1820, is higher than has been observed at Carlisle at any other period of the register. On comparing Mr. Pitt's journal with Mr. Daniell's, I find that the barometers used at Carlisle and London generally rose and fell with great regularity at the

* Edinburgh Encyclopædia, vol. xiv., p. 162.

† Ibid, vol. xiv., p. 162.

‡ "Meteorological Essays and Observations," by J. F. Daniell, F.R.S., p. 400.

same time, sometimes in the same ratio, and that the maxima and minima results were often on the same day.

“ On the 25th of December 1821, a very great depression of the barometer took place at Carlisle. It was so low as 28·26, both in the morning and in the afternoon, and 28·35 at night. It appears that there was a remarkable fall of the barometer, on the same day, both at Geneva and throughout all Scotland.* At the same time a corresponding fall of the barometer was also observed at London.† During the latter part of November and the first three weeks of December, 1821, Carlisle was visited by several violent hurricanes, accompanied with heavy showers of hail, and torrents of rain. On the 18th of December, there was a dreadful thunder storm, and extremely vivid lightning, followed by hail and rain. On the 20th, a violent hurricane, with heavy rain in the night. During the three or four following days, there were several showers of hail and rain, and snow upon the neighbouring mountains. On the 25th, the day on which the greatest depression of the barometer occurred, the weather was fair and pleasant, and continued fair, mild and pleasant until the end of the month. The average of the barometric pressure of this month, 29·321, is the lowest monthly average in the journals. The average temperature of the month, 42·1°, is higher than the December average of any other year, excepting December, 1806, when it was 43·5°. The average height of the barometer of December, 1806, was 29·377, which is the next lowest average for December. The barometer also sunk so low as 28·48 in December of this year; and there was great similarity of weather during the month,—a violent storm of thunder, lightning, hurricanes of wind, and showers of hail and rain. The minimum of the barometer occurred on the 2nd of December,—wind north-west. During the thunder storm which took place on the 13th, the barometer stood at 28·55,—wind south. In the intervening days, the mercury was comparatively low. In 1821, the thermometer ranged from 55° to 30°, in the month of December, and the barometer from 30·23 to 28·26. In December, 1806, the range of the thermometer was from 54° to 26°, and of the barometer from 30·48 to 28·48.”

* *Edinburgh Philosophical Journal*, vol. vi., p. 383.

† “*Meteorological Essays, &c.*,” by J. F. Daniell, p. 446.

TABLE I.—Exhibiting the MAXIMUM and MINIMUM TEMPERATURE of each Month for 24 Years.

YEARS.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1801	51	25	54	30	60	28	68	28½	68	36	70	32½	78	43	75	49	71	36	64	33	55	20½	44	17½
1802	52	12	51	24	58	25	80	34	80	28	65	44	65	45	78	51	71	40	65	35	52	20	51	23
1803	48	18	50	23	61	24	68	32	68	37	75	41	81	48	81	41	68	32	63	34	52	24	54	8
1804	55	5	49	18	59	21	70	29	70	39	77	47	77	50	76	50	75	40	63	33	54	27	47	7
1805	47	23	48	22	55	30	69	37	69	34	70	38	77	53	72	54	76	40	63	23	57	20	52	21
1806	50	25	51	17	52	21	72	32	72	40	71	43	70	52	75	48	67	40	62	26	56	34	54	26
1807	49	17	54	21	52	22	71	25	85	36	68	47	73	50	74	50	64	33	65	32	51	18	50	16
1808	50	17	52	24	51	27	56	25	72	47	76	48	84	46	71	40	67	30	58	31	57	25	52	17
1809	45	14	50	29	54	30	57	27	76	34	70	39	76	51	70	51	68	33	61	36	51	20	51	31
1810	51	18	53	14	52	25	71	35	71	27	78	42	71	49	74	49	73	44	66	31	51	28	51	22
1811	49	18	50	24	57	31	68	26	78½	40	77	43	76	50	69	50	73	43	65½	34	57	32	53	20
1812	50	10	52	32	53	23	51	30	72	35	76	46	68	47	68	47	64	38	60	33	57	20	48	15
1813	50	25	52	34	54	26	64	31	66	42	73	48	73	48	65	42	63	38	59	27	54	24	50	20
1814	41	2	47	20	56	24	65	35	62	34	67	38	78	47	69	42	69	37	61	30	53	18	55	21
1815	45	13	51	31	60	32	73	31	68	44	76	47	68	46	70	47	71	38	60	40	55	13	49	2
1816	49	21	50	10	50	23	63	28	35	35	71	42	71	44	65	46	62	35	60	36	52	18	49	25
1817	54	24	50	32	50	22	60	24	62	39	81	43	65	48	62	43	75	35	54	28	57	34	50	16
1818	52	27	51	18	50	32	60	31	71	41	79	48	79	48	76	43	68	40	65	40	59	36	53	26
1819	52	30	50	25	57	30	59	34	66	34	64	46	76	47	77	50	68	37	66	22	52	20	53	3
1820	47	0	52	25	55	11	70	34	73	30	80	42	74	45	66	40	74	37	66	22	52	20	53	29
1821	55	12	50	24	52	27	71	32	62	32	69	40	76	39	78	50	73	50	63	33	55	30	55	30
1822	48	24	54	33	53	32	70	35	70	36	80	48	71	46	72	47	66	37	60	35	57	32	46	22
1823	45	11	48	12	54	25	56	31	71	38	64	39	64	44	66	43	66	35	61	28	54	27	51	24
1824	52	25	50	28	55	25	68	25	72	30	78	41	75	48	70	41	75	29	63	26	58	25	52	15

The Maximum Temperature that has taken place during 24 years, was at the noon observation of May 25, 1807; thermometer then stood at 85°. In the general remarks for this day, it is stated, the weather was intensely hot; there was distant thunder, and a continued flame of lightning all night.

The Minimum Temperature during 24 years, took place on the morning of January 17, 1814; the thermometer was then 2° below zero, —2°. Among the general remarks, it is stated, that, at this time, there occurred the most severe frost on record. The thermometer was unusually low during the whole of the morning of the 8th, it was at 10°, and in the evening at 9°. On the 13th, morning at 15°, and at night 5°. On the 17th, 2° below zero; morning; 14° at noon; and 3° at night. On the 20th, it was 15° in the morning, and 10° at night.

The average temperature of the whole month, 24.47°, is the lowest monthly mean temperature during the whole period of the journal.

TABLE II.—Containing the MEAN TEMPERATURE of each Month for 24 Years, and the ANNUAL MEAN TEMPERATURE of each Year.

YEARS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean Temperature of each Year.
1801	40.8	41	43.7	46.6	53.1	55.8	59.7	60.8	55.5	49.5	39.8	33.6	48.3
1802	35.4	37.03	42.48	47.1	50.3	54.8	55.63	61.63	55.93	50.63	41.07	38.47	47.54
1803	35.17	38.06	42.71	47.15	50.32	55.56	63.40	60.00	52.25	48.55	39.10	37.20	47.456
1804	41.3	36.9	39.89	43.3	55.7	60.32	60.07	59.4	58.1	51.6	42.7	34.6	48.656
1805	36.5	38.2	43.67	47	50.66	55.4	61.4	60.78	57.67	45	40.5	38.8	47.965
1806	37.70	38.37	40.70	45.70	53.40	56.90	59.50	59.38	55.40	51.08	45.70	43.50	48.944
1807	37.83	37.84	36.24	44.95	51.96	56.05	60.40	61.22	48.20	51.51	35.29	36.08	46.464
1808	37.4	37	37.43	41.51	55.4	59	64	61.2	53.92	43.92	41.46	36.53	47.8406
1809	32.6	41	42.95	41.21	54.7	55.07	59.35	57.91	53.6	51.22	40.41	39.83	47.4875
1810	36.9	37.62	38.7	46.68	48.4	59.35	59.28	59.02	56.29	48.4	39.6	38.2	47.37
1811	34.98	39.3	43.7	47.5	54.8	57.22	60.6	57.67	55.25	53.4	46.12	37.37	49.00
1812	36	41.05	36.65	40.97	51.3	55.8	56.81	57.3	54.4	48.5	40.2	34.72	46.142
1813	35.8	42.41	44.5	45.1	51.4	56	58.15	56.24	53.20	44.72	39.23	37.24	47
1814	24.47	35	38.21	48.7	47.18	53.32	59.5	57.74	55.7	45.85	40.07	38.1	45.32
1815	32.85	42.71	43.6	46.8	53.7	57	58	58	55.3	50	36.86	34.08	47.4
1816	36.4	35.6	37.4	42.4	48.87	53.68	55.3	55.7	51.4	48.86	38.6	36.8	45.085
1817	40	41.8	40.43	48.1	47	57.8	56.6	55	55	41.3	47.33	35	47.12
1818	39.3	36.7	38.63	42.4	53	60.3	62.1	57.2	54.1	53.4	48.55	40.06	48.812
1819	39.53	38.5	43.05	46.5	52.3	54.8	60	63.3	54.5	46.6	37.5	32	47.4
1820	30.4	38.20	38.40	47.60	51.10	54.70	59.20	56.5	53.3	45.4	41.8	40.8	46.42
1821	38.2	37	40.8	48.4	47	54	57.1	59.8	57	50	45.4	42.1	48.06
1822	40	42.45	44	46	53.4	61.14	58.5	58.3	52	49.5	45.8	36	49
1823	31.7	35.6	40.4	43	52.7	52.3	56	55.3	53	45.5	45.1	40	45.9
1824	40.50	40.00	39.80	45.60	53.00	56.00	59.70	57.80	55.60	48.00	42.50	40.00	48.21

The annual means of the thermometer for 24 years, divided into periods of six and twelve years each, give the following results:—

The average or mean temperature of the first six years, viz., 1801, 1802, 1803, 1804, 1805, 1806	48.1435
The mean temperature of the second six years, viz., 1807, 1808, 1809, 1810, 1811, 1812	47.3836
The mean temperature of the third six years, viz., 1813, 1814, 1815, 1816, 1817, 1818	46.7895
Mean temperature of the last six years, viz., 1819, 1820, 1821, 1822, 1823, 1824	47.4983
Mean temperature of the first twelve years, ending 1812	47.7635
Mean temperature of the last twelve years, ending 1824	47.144
Mean temperature of the 24 years	47.4537

TABLE III.—Containing the MAXIMUM and MINIMUM HEIGHT of the BAROMETER of each Month for 24 Years.

YEARS.	January.		February.		March.		April.		May.		June.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
1801	30.14	29.07	30.19	28.96	30.33	28.66	30.43	29.22	30.21	29.57	30.25	29.83
1802	30.32	28.54	30.27	29.13	30.57	28.98	30.35	29.34	30.38	29.54	30.34	29.25
1803	30.43	29.00	30.37	29.00	30.53	29.55	30.51	29.01	30.41	29.00	30.55	29.60
1804	30.18	28.65	30.57	28.95	30.10	28.96	30.25	29.17	30.40	29.43	30.42	29.44
1805	30.28	28.61	30.30	28.82	30.30	29.38	30.33	29.52	30.42	29.02	30.42	29.25
1806	26.93	28.20	30.26	29.11	30.43	29.06	30.49	29.39	30.48	29.03	30.48	29.18
1807	30.71	28.85	30.68	28.88	30.66	28.93	30.25	28.92	30.52	28.88	30.33	29.44
1808	30.50	28.74	30.86	29.20	30.54	29.55	30.28	28.82	30.23	29.44	30.34	29.60
1809	30.11	28.46	30.40	28.50	30.50	29.18	30.54	28.95	30.32	29.21	30.57	29.09
1810	30.36	29.70	30.45	28.86	30.14	28.95	30.28	29.24	30.43	29.47	30.44	29.76
1811	30.59	28.90	30.22	28.80	30.67	29.10	30.16	29.10	30.33	29.37	30.42	29.35
1812	30.35	28.85	29.95	29.00	30.42	29.11	30.27	29.30	30.34	29.31	30.53	29.17
1813	30.58	29.17	30.45	28.66	30.53	29.45	30.49	28.75	30.13	29.27	30.41	29.60
1814	30.20	28.75	30.47	29.12	30.58	28.72	30.34	29.15	30.64	29.60	30.46	29.71
1815	30.51	29.00	30.47	29.16	30.35	28.71	30.45	29.21	30.33	29.38	30.37	29.47
1816	30.37	28.71	30.37	29.17	30.38	28.96	30.27	29.15	30.24	29.33	30.17	29.36
1817	30.57	28.43	30.61	29.22	30.45	28.51	30.74	29.84	30.37	29.17	30.33	29.09
1818	30.37	28.96	30.25	28.90	30.45	28.24	30.62	29.05	30.51	29.33	30.51	29.40
1819	30.51	28.77	30.10	28.94	30.52	29.15	30.28	29.07	30.20	29.66	30.31	29.32
1820	30.94	28.82	30.42	29.36	30.52	28.80	30.75	29.23	30.37	29.11	30.48	29.27
1821	30.84	29.04	30.77	29.33	30.31	29.00	30.20	28.79	30.30	29.15	30.53	29.70
1822	30.35	29.45	30.65	28.70	30.53	29.10	30.46	29.14	30.44	29.56	30.37	29.72
1823	30.31	28.91	30.40	28.76	30.51	28.77	30.44	29.10	30.51	29.17	30.41	29.32
1824	30.67	28.62	30.50	28.90	30.30	28.61	30.58	29.10	30.66	29.61	30.47	29.40

Table III.—Containing the Maximum and Minimum Height of the Barometer, &c.—*continued.*

YEARS.	July.		August.		September.		October.		November.		December.	
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.
1801	30.17	29.37	30.34	29.6	30.32	29.48	30.27	28.91	30.17	28.98	30.16	28.65
1802	30.20	29.06	30.31	29.44	30.83	29.03	30.40	29.06	30.20	29.09	30.35	28.97
1803	30.44	29.81	30.32	29.32	30.47	29.29	30.44	29.45	30.48	28.45	30.39	28.89
1804	30.33	29.35	30.37	29.26	30.55	29.76	30.10	29.12	30.55	29.33	30.65	28.79
1805	30.24	29.22	30.25	29.21	30.66	29.00	30.53	29.37	30.81	28.97	30.33	28.64
1806	30.16	29.42	30.10	29.10	30.27	29.54	30.31	28.82	30.25	28.78	30.48	28.48
1807	30.30	29.48	30.21	29.53	30.20	29.08	30.16	29.20	30.23	28.67	30.36	28.80
1808	30.23	29.60	30.27	29.37	30.36	29.38	30.43	28.77	30.40	28.77	30.35	28.93
1809	30.28	29.43	29.94	29.30	30.15	29.20	30.32	29.76	30.48	29.12	30.04	28.07
1810	30.17	29.36	30.27	29.34	30.48	29.60	30.44	28.88	30.38	28.90	30.70	28.67
1811	30.30	29.60	30.31	29.47	30.44	29.01	30.25	28.77	30.45	29.06	30.32	28.95
1812	30.51	29.37	30.30	29.62	30.31	29.75	29.94	28.13	30.35	29.28	30.63	29.25
1813	30.32	29.41	30.45	29.54	30.48	28.97	30.41	28.81	30.33	29.03	30.51	29.01
1814	30.28	29.56	30.47	29.37	30.48	29.45	30.41	29.14	30.26	29.12	30.21	28.72
1815	30.35	29.65	30.34	29.48	30.27	29.33	30.45	28.95	30.71	28.71	30.51	28.75
1816	29.92	29.16	30.26	29.41	30.24	29.03	30.17	29.24	30.80	28.75	30.71	28.53
1817	30.11	29.20	30.17	29.03	30.27	28.87	30.47	28.91	30.54	29.23	30.16	28.57
1818	30.37	29.74	30.37	29.57	30.28	29.27	30.37	29.21	30.27	29.40	30.71	29.31
1819	30.36	29.38	30.46	28.91	30.61	29.30	30.40	29.35	30.30	29.12	30.31	29.01
1820	30.31	29.34	30.24	29.37	30.36	29.30	30.66	28.60	30.38	29.41	30.31	29.60
1821	30.35	29.36	30.30	29.12	30.21	29.11	30.33	28.74	30.25	28.77	30.23	28.26
1822	30.20	29.43	30.25	29.35	30.41	29.43	30.06	29.07	30.13	28.65	30.65	28.47
1823	30.21	29.34	30.14	29.37	30.35	29.11	30.46	28.75	30.66	29.03	30.39	28.65
1824	30.53	29.43	30.48	29.42	30.32	29.20	30.21	29.00	30.13	28.33	30.33	28.66

The maximum height of the barometer during 24 years, took place in the morning of January 9, 1820; wind N.E.; thermometer 25° . 30.94 inches. During the early part of this month, the thermometer was remarkably low. On the morning of the 1st, it was as low as 30°; at noon 14°; and at night 10°. On the 3d, in the morning, 20°; at noon, 20°; and at night, 7°. On the morning of the 22d, the thermometer was at zero, the lowest temperature that has occurred during the period of the register, with the exception of January 17, 1824. The barometer fluctuated between 30.94 and 28.82.

The minimum height of the barometer during 24 years, took place in the morning of December 15, 1809; wind S.; thermometer 36° . 28.07 . For two or three days preceding the 9th of this month, the weather was stormy, the wind S., violent and strong. In the night of the 9th, there was a hurricane from the south; barometer stood 28.83. In the night of the 14th, another hurricane came on from the south, and continued on the morning of the 15th, when the barometer was at 28.07. The words in the register are, "a dreadful hurricane, with heavy snow and sleet till noon, moderate afterwards. In the night, much lightning, which was extraordinarily vivid." The barometer fluctuated between 30.04 and 28.07.

TABLE IV.—Showing the MEAN HEIGHT of the BAROMETER each Month during 24 Years, and the ANNUAL MEAN of each Year.

YEARS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Barometric Mean of each Year.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
1801	29.71	29.70	29.71	30.02	29.85	30.03	29.81	30.08	29.91	29.71	29.64	29.38	29.796
1802	29.83	29.65	29.97	29.83	30.05	29.74	29.72	29.94	29.98	29.67	29.73	29.70	29.8175
1803	29.766	29.782	30.052	29.809	29.903	29.998	30.135	30.010	30.121	30.070	29.500	29.595	29.895
1804	29.512	30.09	29.66	29.763	29.871	30.0817	29.858	29.89	30.132	29.644	29.935	29.906	29.8619
1805	29.632	29.721	29.86	29.88	29.93	29.937	29.859	29.853	29.907	29.95	30.2	29.579	29.859
1806	29.345	29.679	29.750	30.123	29.990	30.064	29.772	29.753	29.952	29.855	29.590	29.377	29.7706
1807	29.94	29.631	30.03	29.874	29.833	29.9787	29.858	29.843	29.742	29.794	29.491	29.816	29.8192
1808	29.704	30.07	30.20	29.82	29.86	29.96	29.951	29.838	29.842	29.632	29.82	29.804	29.875
1809	29.516	29.613	30.090	29.868	29.908	29.905	29.932	29.692	29.706	30.150	29.988	29.438	29.817
1810	30.086	29.777	29.681	29.8453	29.97	30.12	29.782	29.865	30.0617	29.93	29.50	29.6573	29.8563
1811	29.856	29.405	30.083	29.75	29.794	29.91	30.032	29.875	29.986	29.587	29.862	29.631	29.81425
1812	29.818	29.53	29.811	29.972	29.887	29.932	29.969	30.0453	30.04	29.407	29.842	30.012	29.856
1813	30.067	29.59	30.114	29.976	29.767	30.074	29.87	30.105	30.034	29.714	29.688	29.84	29.903
1814	29.646	30.02	29.807	29.837	30.087	30.0873	29.923	29.91	30.091	29.80	29.676	29.631	29.8763
1815	29.90	29.71	29.618	29.964	29.895	29.892	30.091	29.88	29.933	29.823	29.966	29.74	29.8676
1816	29.60	29.80	29.748	29.75	29.86	29.94	29.66	29.933	29.857	29.82	29.744	29.628	29.78
1817	29.697	29.77	29.676	30.31	29.783	29.84	29.77	29.677	29.97	30.04	29.865	29.55	29.83
1818	29.63	29.615	29.453	29.778	30.00	30.02	30.065	30.097	29.75	29.846	29.80	30.04	29.841
1819	29.621	29.56	29.89	29.818	29.953	29.88	30.04	30.054	29.95	29.87	29.74	29.71	29.84
1820	29.863	29.98	29.88	30.00	29.74	29.955	29.97	29.80	29.935	29.60	29.861	29.943	29.877
1821	29.874	30.247	29.56	29.61	29.863	30.17	29.923	29.933	29.68	29.827	29.64	29.321	29.804
1822	30.08	29.87	29.843	29.94	30.02	30.101	29.83	29.858	29.98	29.60	29.534	30.03	29.89
1823	29.72	29.37	29.72	29.87	29.85	29.916	29.74	29.807	29.90	29.70	30.06	29.58	29.77
1824	30.00	29.80	29.79	29.88	30.02	30.00	29.99	29.92	29.86	29.61	29.49	29.62	29.83

The annual mean heights of the barometer of each year for 24 years, divided into periods of six and twelve years, similar to the annual means of the thermometer, give the following results :—

	Inches.
The average or mean height of the barometer of the first six years, ending 1806	29.8333
The mean height of the second six years, ending 1812	29.8396
Mean height of the third six years, ending 1818	29.8496
Mean height of the last six years, ending 1824	29.8351
Mean height of the first twelve years, ending 1812	29.8364
Mean height of the last twelve years, ending 1824	29.8423
Mean height of 24 years	29.8393

TABLE V.—Exhibiting the QUANTITY of RAIN of each Month for 24 Years, and the ANNUAL QUANTITY of each Year.

YEARS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual Quantity of each Year.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
1801	3.000	2.456	2.874	0.862	1.931	0.325	5.627	0.908	4.804	4.702	1.496	2.481	31.466
1802	1.970	2.623	0.840	2.566	0.470	2.343	5.308	2.509	2.344	4.420	0.670	2.441	28.504
1803	1.042	3.556	1.472	1.980	2.940	2.524	0.755	3.694	2.322	2.030	2.450	2.775	27.520
1804	5.335	1.995	2.400	1.885	2.475	2.660	3.275	6.270	1.010	5.500	2.040	1.000	35.845
1805	1.950	2.455	2.300	0.630	1.740	2.380	5.060	3.130	2.170	0.470	0.460	3.610	26.355
1806	3.26	2.10	0.77	0.89	1.47	1.26	3.21	5.57	3.50	1.25	5.32	2.94	31.54
1807	0.80	3.17	0.76	1.88	2.41	1.59	2.45	1.93	5.37	3.36	2.53	1.50	27.75
1808	2.10	1.57	0.20	1.20	2.86	0.82	3.90	4.48	1.84	3.95	3.06	1.88	27.86
1809	3.50	2.53	0.56	1.20	3.75	2.85	1.84	5.19	4.95	0.38	1.84	3.18	31.77
1810	1.84	1.22	3.80	1.01	0.53	1.60	3.24	3.22	1.70	3.12	3.15	4.30	28.73
1811	1.30	3.80	2.20	1.60	6.02	2.25	2.40	2.88	2.35	2.47	4.00	3.26	34.53
1812	1.41	4.62	2.75	1.12	1.71	2.81	1.61	2.58	2.91	2.72	2.02	0.61	26.87
1813	2.02	3.67	0.81	1.68	4.01	1.00	3.11	1.08	1.98	3.12	2.23	0.97	25.68
1814	0.44	1.12	0.93	4.31	0.51	1.50	3.61	2.09	0.96	3.01	4.16	4.92	27.56
1815	0.82	1.54	4.05	0.86	3.86	3.13	1.66	2.54	3.38	3.77	2.22	3.93	31.76
1816	1.85	0.78	1.88	1.38	2.31	1.51	4.57	1.33	3.32	2.36	2.04	2.44	25.77
1817	1.57	3.20	2.13	0.31	2.71	3.06	3.64	5.71	1.46	1.17	2.80	2.75	30.51
1818	3.51	1.67	6.10	2.56	1.11	1.75	4.11	1.85	3.66	3.49	3.30	1.60	34.71
1819	3.62	3.10	1.58	1.68	1.87	2.11	3.66	1.60	2.27	5.15	3.28	3.34	33.26
1820	2.25	1.80	2.47	1.00	3.40	3.64	2.02	4.01	3.11	2.45	1.60	2.42	30.17
1821	1.65	0.75	3.68	2.74	1.26	1.11	1.55	1.74	3.45	4.67	4.70	4.63	31.93
1822	1.53	2.87	4.01	1.90	1.34	1.05	5.33	5.33	1.33	4.06	4.31	2.35	35.38
1823	2.68	2.02	1.96	1.64	4.61	1.57	5.12	5.18	3.80	2.84	1.62	2.47	35.51
1824	1.63	0.77	2.50	0.85	1.23	2.23	2.55	2.95	3.85	3.01	5.53	5.63	32.73
Total .	51.077	55.385	53.026	37.433	57.526	47.072	79.605	77.771	67.840	73.472	66.826	67.427	733.71

The following are the mean results of the fall of rain during 24 years, divided into periods similar to those of the thermometer and barometer :—

Mean quantity of rain of the first six years, 1801—1806	30.205 inches.	Mean quantity of the first twelve years	1801—1812	29.895 inches.
Mean quantity of rain of the second six years . 1807—1812	29.585	Mean quantity of the last twelve years	1812—1824	31.246
Mean quantity of rain of the third six years . 1813—1818	29.33	Mean for the first eighteen years	1801—1818	29.706
Mean quantity of the last six years . 1819—1824	33.163	Mean of twenty-four years	1801—1824	30.371

The highest annual mean height of the barometer that has occurred is 29.903. This was in the year 1813, and the quantity of rain during that year, 25.68 inches, was the least that has fallen in one year during the period of the journals.

The lowest annual mean of the barometer, 29.77, was in 1823, and the quantity of rain of that year, 35.51 inches, the greatest in the journal, except in the year 1804, when the quantity was 35.845; barometer 29.8619.

It may be remarked, that an unusually large quantity of rain fell at Carlisle during the last seven years.

The greatest fall of rain in one month during 24 years, took place in August 1804; mean barometric pressure of the month, 29.89 . . . 6.270 inches.

The least fall of rain in one month during 24 years, was in March 1808; mean barometric pressure of the month, 30.20 . . . 0.20

TABLE VI.—Showing the QUANTITIES of RAIN during the Six Summer and Six Winter Months of each Year for 23 Years.

YEARS.	From beginning of April to end of September.	From beginning of October to end of March next following.	YEARS.	From beginning of April to end of September.	From beginning of October to end of March next following.
	Inches.	Inches.		Inches.	Inches.
1801	14.457	14.112	1813	12.860	8.810
1802	15.540	13.601	1814	12.980	18.500
1803	14.215	16.965	1815	15.430	14.430
1804	17.575	15.245	1816	14.420	13.740
1805	15.110	10.670	1817	16.890	18.000
1806	15.900	14.240	1818	15.040	16.690
Mean for } 6 years . }	15.466	14.139	Mean for } 6 years . }	14.603	15.028
1807	15.630	11.260	Mean for } 18 years }	15.139	14.518
1808	15.100	15.480			
1809	19.780	12.260	1819	13.190	18.290
1810	11.300	17.870	1820	17.180	12.550
1811	17.540	18.510	1821	11.850	22.410
1812	12.740	11.850	1822	16.250	17.380
			1823	21.920	11.830
Mean for } 6 years . }	15.348	14.538	Mean for } 5 years . }	16.078	16.492
Mean for } 12 years }	15.407	14.338	Mean for } 23 years }	15.344	14.986

The Average or Mean Quantity of Rain of each Month for 24 Years :

The mean quantity of rain of the month of January for 24 years	Inches. 2,128
February for ditto . .	2,308
March for ditto . .	2,209
April for ditto . .	1,560
May for ditto . .	2,355
June for ditto . .	1,960
July for ditto . .	3,317
August for ditto . .	3,240
September for ditto . .	2,827
October for ditto . .	3,061
November for ditto . .	2,784
December for ditto . .	2,809

REMARKS.—Meteorology, as a science, has been rapidly advanced of late years, especially by American observers. A law has been laid down for storms, which is fully acknowledged ; and if the barometrical and hygrometrical states of the atmosphere are closely studied, the probable state of the weather for several days beforehand may be told with singular accuracy. There is not a cloud that floats which not only tells of that which is, but also of that which is soon to come. The magnificent and towering cumulus, glittering like a snow-covered mountain in the bright sunlight at mid-day, indicates rain and

wind; this cloud is the produce of a storm generating; rain is the inevitable result, either in the district, or at no great distance; most other forms of cloud are the produce of this (the cumulus), modified and altered in form. The rainfall to the south and west of Carlisle, amongst the Cumberland mountains is more than double that at Carlisle; this will account for the excessive floods to which the Eden, the Peterill, and the Caldew are liable; and will also explain how they are frequently flooded when probably there has been no rain, or only slight showers have fallen at Carlisle.

TABLE OF MORTALITY.

MORTALITY of the two REGISTRAR DISTRICTS of ST. CUTHBERT'S and ST. MARY'S, which differ very little from the City Boundary. Population of District in 1841, 23,959.

YEAR.	St. Cuthbert's.	St. Mary's.	Total.	Deaths per Thousand.	REMARKS.
1842	281	361	642	{ 27 nearly.	
1843	245	337	582	24.25	
1844	244	392	636	26.50	
1845	285	305	590	24.57	
1846	365	476	841	35.00	
1847	485	569	1054	43.92	{ Many railway labourers in district.
1848	353	402	755	31.46	

NOTE.—The averages have been calculated from a population of 24,000 throughout. This will make the latter averages rather higher than they ought to be, if the population is now 27,000. The great mortality in 1846, 1847, and 1848, is said to have been increased by the railway labourers then in the neighbourhood.

The last return of the population of Carlisle, by the census of 1841, was 23,959. At the present time I should guess it at 27,000, for there has been a large increase since the formation of the railways. The note to the registrar's returns attributes to that cause the increased rate of mortality in the years 1846 and 1847.

Hospitals and Charitable Institutions for the Relief of the Sick Poor.—The following abstracted from published reports put in during the inquiry, will show that if fever and disease has been rife in Carlisle, benevolence has not been slack in providing means of relief and in administering it. It has, however, been asserted that fever ought not to exist, and it is, in fact, fully proved that wherever it is common there the removable, but predisposing causes may be found.

There is little or no fever in well regulated gaols, and there cannot be a doubt but that it may be prevented, at least to the same extent, amongst a similar class of persons when at liberty, if they are placed under parallel conditions (namely), free from accumulated filth, and with abundance of fresh air. Leprosy, plague, and the fatal sweating sickness formerly committed dreadful ravages in this country. In the years 1597-98, the

plague raged in Carlisle, and the neighbourhood, with extreme violence, as also at different intervals over the whole island, and indeed throughout Europe. During this period men had much fewer comforts than at present; agricultural land was not drained, and but comparatively small portions were cultivated; there were no roads worthy of the name; houses were mere hovels, built for the most part out of timber and mud; streets were narrow, and without any form of pavement; refuse of every sort was allowed to accumulate close to the doors and windows, and scavenging was not thought of; drains and sewers had no existence, even in the metropolis, and to walk a mile in the streets, during the daytime, was a task of danger. The great fire in 1666 is said to have banished plague from the metropolis, as the city was rebuilt upon a more improved plan; the streets were set out wider, and some attention was paid to other means of improvement. The lanes and courts of Carlisle cannot all be widened, but all may be perfectly drained, and the refuse may be removed at short intervals, so that with a full supply of water, proper sewers and house-drains, improved yard and court pavements, and regular cleansing with broom and water, fever may in a great measure be reduced, if not wholly banished from the town.

During my several inspections I have ever found most disease where the refuse is habitually retained for long periods, on a damp subsoil, in immediate contact or close to dwelling-houses. But where houses are built on the side of a hill, or on ground which slopes towards them, and where the refuse is stored and retained for long periods, months at a time, behind such houses, on a site higher than the floors, so that the liquid refuse, by percolation, or infiltration, finds its way into the subsoil, and under the house. In all such places severe disease first appears and is most fatal. The same set of circumstances have been particularly remarked as producing these results by that most accurate of observers, Dr. Sutherland.

No other natural advantages will compensate for such a state of things. The houses may be isolated; they may be well finished, superior in other forms of accommodation, have a full water supply, and be open to every wind that blows, and still disease will linger and haunt the spot. Perfect drainage, and an habitual removal of all liquid and solid refuse, at short intervals, will alone be of any avail. And all these regulations are imperatively required wherever human beings dwell if health is to be retained, let it be either in a palace or a hovel.

CHARITABLE MEDICAL INSTITUTIONS IN CARLISLE.

Infirmary,—Dispensary,—House of Recovery,—and Humane Society.

OFFICERS OF THE DISPENSARY.—*President*: The Right Honourable William Earl of Lonsdale. *Vice-Presidents*: The Right Honourable Sir J. R. G. Graham, Bart, M.P.; P. H. Howard, Esq., M.P.; W. Marshall, Esq., M.P.; The Dean of Carlisle; The Mayor of Carlisle. *Physician Extraordinary*: Thomas Barnes, M.D., F.R.S.E. *Surgeon Extraordinary*: (Vacant.) *Physician*: (Vacant.) *Surgeons*: (Vacant.) *Quarterly Committee*: Mr. W. Halton; Mr. W. Stordy; Mr. R. Cowen; Mr. Thurnam; Mr. George Dixon; Mr. J. D. Carr. *Secretary and Treasurer*: Mr. Waldie. *Apothecary*: John Robinson, M.D. *Collector*: Mr. Samuel Harris.

OFFICERS OF THE HOUSE OF RECOVERY, 1849-50.—*President*: The Right Honourable William Earl of Lonsdale. *Vice-Presidents*: The Hon. and Right Rev. the Lord Bishop of Carlisle; The Right Hon. Sir J. R. G. Graham, Bart., M.P.; P. H. Howard, Esq., M.P.; W. N. Hodgson, Esq., M.P.; The Mayor of Carlisle; The Very Rev. the Dean of Carlisle. *Treasurer*: Mr. John Norman. *Committee*: R. Cowen, Esq.; P. Dixon, Esq.; J. Ferguson, Esq., Fisher-street; W. Halton, Esq.; Rev. C. G. V. Harcourt; G. H. Head, Esq.; W. Hodgson, Esq., Bowness; Mr. Railton; Mr. W. Rees; Wm. Stordy, Esq.; Mr. Sheffield; Mr. Thurnam. *Secretary*: Mr. H. J. Halton. *Physician*: Thomas Barnes, M.D., F.R.S.E. *Surgeon-Apothecary*: Mr. Elleray Armstrong. *Inspector*: Robert Stubbs. *Matron*: Mrs. McAllister. *Collector*: Mr. John Thompson.

HOUSE OF RECOVERY.

TABLE showing the number of FEVER PATIENTS admitted into the HOUSE OF RECOVERY during the year 1849.

Monthly Return of the Admission and Death of Typhus Patients.						
1847-8	Admitted.			Died.		
	Males.	Females.	Total.	Males.	Females.	Total.
December	4	3	7	1	..	1
January	3	2	5	..	..	..
February	3	6	9	..	1	1
March . . . .	..	2	2	..	1	1
April . . . .	..	..	..	..	..	..
May	1	..	1	1	..	1
June	1	1	2	..	..	..
July	1	..	1	..	..	..
August . . . .	..	..	..	..	..	..
September	1	2	3	..	1	1
October . . . .	..	1	1	..	..	..
November . . . .	..	..	..	..	..	..
Total	14	17	31	2	3	5

Fever Patients, arranged according to their Age and Sex.

Age.	Total Treated.	Total Died.	Males Treated.	Males Died.	Females Treated.	Females Died.	Proportion of Deaths in Males.	Proportion of Deaths in Females.	Proportion of Deaths in both Sexes.
0 to 10	4	..	1	..	3	..	..	..	..
11 „ 20	6	..	3	..	3	..	..	..	..
21 „ 30	7	1	3	..	4	1	..	1 in 4	1 in 7
31 „ 40	4	..	2	..	2	..	..	..	..
41 „ 50	3	..	1	..	2	..	..	..	..
51 „ 60	5	3	3	2	2	1	1 in 1.5	1 in 2	1 in 1.66
61 „ 80	2	1	1	..	1	1	..	1 in 1	1 in 2
Total .	31	5	14	2	17	3	1 in 7	1 in 5	1 in 6

The following remarks and also the rules, abstracted from the last Report on the House of Recovery, will be found generally useful. The rules laid down for the management of apartments, where persons are confined with contagious fever, may be adopted and used in any house where such disease exists.

“REMARKS.—Among the fatal cases of typhus fever, the committee are sorry to have to record the death of Mrs. Stubbs, the matron, who had filled that office with great satisfaction during a period of ten years. Two patients were in a dying state when brought to the house and died the following day. Another was hopeless, and died two days after admission; and the fifth case of death was a man 60 years of age, who was brought from Brampton in a very advanced stage of the disease. A male nurse, who has been employed occasionally at the hospital for many years, caught typhus fever, and became a patient. He had some unfavourable symptoms, but made a good recovery. Small-pox, which was very prevalent in the early part of the year, has now disappeared. Mrs. McAlister, the daughter of the late matron, has been appointed her successor in the hospital.

“As Asiatic cholera has again made its appearance in several places in this country, although it has not hitherto made much progress, it will in all probability reach Carlisle, and it is gratifying to observe that efforts are being made by the public authorities to check this terrible scourge of humanity. Not only the removal of nuisances, and cleansing the streets, lanes, and courts, but also cleanliness of habitation and person, have been found of essential service in preventing the spread of cholera. In Carlisle, the drains and cesspools near the houses, and the grates and gutters in the streets, are almost constantly emitting noxious vapours. The houses and persons of many of the poor inhabitants are not in a cleanly condition. Good sewerage and drainage are also much wanted, and would have a great effect in preventing both typhus fever and cholera.

“In all contagious diseases, some atmospheric change is necessary to their becoming epidemic, and there are local circumstances which favour their propagation. It is not known what gives rise to this necessary change in the atmosphere, or in what that change consists; but it

is well known that damp and dirt—that nuisances of all kinds, and particularly animal and vegetable matter in a state of decomposition—are circumstances that favour the propagation of these diseases. Whatever renders the atmosphere impure, impairs the health and predisposes the body to disease, especially to typhus fever and cholera, and whenever a number of sick of either disease are crowded together in close, dirty, and unventilated rooms, these diseases spread from person to person with great virulence and malignity. Even in the Carlisle fever-house, where great attention is paid to cleanliness and ventilation, several nurses have caught typhus fever from patients and have died; and in 1832, when it was used as a cholera hospital, four of the office-bearers were seized with cholera, and only one recovered. The matron of the hospital, a nurse, and a washerwoman, fell victims to the disease. Asiatic cholera was then met with in the same localities in Carlisle, as typhus fever, and there were strong reasons for believing that its spreading was promoted by similar causes, and that it was contagious. Ventilation, cleanliness, and limewashing the dwellings of the poor, which have been of so much benefit in preventing the former disease, are of the greatest use and importance in preventing the latter.

“ Much has been said respecting the mode of living, and the diet most suitable for preventing an attack of cholera, and there is great difference of opinion on these subjects. Experience, however, has shown, that personal and domestic cleanliness, warm clothing, and temperance, and that plan of diet which agrees best, and maintains the body in good health, are the surest safeguards.* If any person should unfortunately become affected with the disease, or have the premonitory symptom of bowel complaint, immediate application should be made for medical assistance—for it is generally an easy matter to check the disease at the commencement, and much better to have the benefit of medical advice, than to trust to the use of medicines indiscriminately recommended by unprofessional persons.”

A TABLE showing the Number of Patients admitted into the Carlisle House of Recovery since its Establishment.

YEAR.	Number of Patients Admitted.	In Typhus alone.
Nov. 7, 1820, to Dec. 3, 1821	61	56
Dec. 3, 1821 ,, 2, 1822	44	40
,, 2, 1822 ,, 1, 1823	67	62
,, 1, 1823 ,, 1, 1824	92	88
,, 1, 1824 ,, 5, 1825	68	64
,, 5, 1825 ,, 4, 1826	58	50
,, 4, 1826 ,, 3, 1827	72	67
,, 3, 1827 ,, 1, 1828	52	51
,, 1, 1828 ,, 1, 1829	76	70
,, 1, 1829 ,, 1, 1830	66	64
,, 1, 1830 ,, 1, 1831	119	119†

* See remarks on ventilation in this Report, p. 89.

† It appears from the Report for that year, that Epidemic Typhus appeared at Warwick Bridge during the winter of 1830, and that only 55 of these 119 cases were from Carlisle.

A TABLE showing the Number of Patients admitted into the Carlisle House of Recovery since its Establishment—*continued*.

YEAR..	Number of Patients Admitted.	In Typhus alone.
Dec. 1, 1831 to Dec. 1, 1832	53	48
„ 1, 1832 „ 1, 1833	14	14
„ 1, 1833 „ 1, 1834	26	23
„ 1, 1834 „ 1, 1835	51	47
„ 1, 1835 „ 1, 1836	61	50
„ 1, 1836 „ 1, 1837	94	86
„ 1, 1837 „ 1, 1838	270	265
„ 1, 1838 „ 1, 1839	61	55
„ 1, 1839 „ 1, 1840	159	150
„ 1, 1840 „ 1, 1841	192	169
„ 1, 1841 „ 1, 1842	156	153
„ 1, 1842 „ 1, 1843	86	83
„ 1, 1843 „ 1, 1844	25	23
„ 1, 1844 „ 1, 1845	43	25
„ 1, 1845 „ 1, 1846	40	23
„ 1, 1846 „ 1, 1847	190	174
„ 1, 1847 „ 1, 1848	61	31
„ 1, 1848 „ 1, 1849	78	19

Every patient presented for admission must be accompanied by a certificate signed by the medical attendant, and also by the individual himself, a relative, master, or overseer, as the case may be, guaranteeing the payment of all necessary expenses.

Overseers are requested further to observe, that the Committee have resolved, “that in case of parish paupers, &c., admitted from any part of the city or suburbs, the overseers do further engage that the said paupers, if they die in the house, shall be buried in the parish from which they were removed.”

For the domestic servants of subscribers, the sum of 7s. per week is to be paid ; for persons supporting themselves by manual labour, not being in the receipt of a larger income than 1*l*. per week, and *bonâ fide* paying for themselves, 3s. 6*d*. ; for persons who live by manual labour (not included in the last class), 8s. 9*d*. ; for all other patients. 10s. 6*d*. per week. For children under 12 years of age, only half of the above sums is claimed. No extra charges are ever made. The accounts are in all instances to be paid either to the treasurer, Mr. John Norman, or to the collector, Mr. John Thompson.

Donations of cast-off articles of clothing can be most usefully appropriated at this institution.

RULES TO BE OBSERVED IN THE APARTMENTS OF THOSE WHO ARE
CONFINED BY CONTAGIOUS FEVER.

(Abstracted from the Local Report.)

“ 1. It is of the utmost importance to the sick and their attendants, that there be a constant admission of fresh air into the room, and especially about the patient's bed. The door, or a window, should therefore be kept open both day and night—care being taken to prevent the wind from blowing directly on the patient.

“ 2. An attention to *cleanliness* is indispensable. The linen of the patient should be often changed; and the dirty clothes, &c., should be immediately put into fresh cold water, and afterwards well washed. The floor of the room should be cleansed every day with a mop, and all discharges from the patient should be immediately removed, and the utensils washed. A little chloride of lime in solution should always be at hand, one part of which, with six or eight parts of water, forms a liquid, with which the floor and the walls of the room should be occasionally sprinkled, and of which a little should always stand in the chamber utensils.

“ 3. Nurses and attendants should endeavour to avoid the patient's breath, and the vapours from the discharges; or when that cannot be done, they should hold their breath for a short time: they should place themselves, if possible, on the side of the bed from which the current of air comes and carries off the infectious vapours.

“ 4. Visitors should not come near to the sick, nor remain with them longer than is absolutely necessary; they should not swallow their spittle, and should clear the mouth and nostrils when they leave the room.

“ 5. No dependence should be placed on vinegar, camphor, or other supposed preventives, which, without attention to *cleanliness* and admission of *fresh air*, are not only useless, but by their strong smell, render it impossible to perceive when the room is filled with bad air or noxious vapours.

“ N.B.—If these rules are strictly observed, an infectious fever will seldom, if ever, be communicated; but if neglected (especially where the patient is confined to a small room), scarcely one person in fifty, who may be exposed to it, can resist the contagion; even infants at the breast do not escape it, though providentially less liable to be affected than adults.

“ * * * It may not be improper to describe the process of fumigation, which is extremely simple, and easily performed:—

“ “ Take an equal quantity of powdered nitre and strong vitriolic acid, or oil of vitriol—about six drachms of each are sufficient—mix them in a teacup, stirring them now and then with a tobacco-pipe or piece of glass: the tea-cup must be removed occasionally to different parts of the room, and the fumes will continue to rise for several hours. The oil of vitriol should be in quantity or measure, *not in weight.* ”

COMPARATIVE STATEMENT of the Number of Patients admitted to the benefit of the Carlisle Dispensary, the Number cured, as also of Moneys received and expended since the Institution was established in 1810 down to 1850.

Year.	Number of Patients at the Commencement.	Number Admitted.	Number Cured.	Income.			Expenditure.			Balance.		
				£.	s.	d.	£.	s.	d.	£.	s.	d.
1810	..	848	..	245	12	7	247	9	7	..		
1811	93	822	619	222	10	4	134	13	7	87	16	9
1812	60	927	699	223	7	3	146	2	11	165	1	1
1813	66	1,035	735	207	13	5	174	12	8	198	1	15
1814	56	1,046	749	207	10	0	134	2	6	271	9	1
1815	73	1,016	745	189	0	3	211	8	9	249	4	11
1816	80	986	789	190	6	3	169	7	2	270	4	0
1817	64	1,687	1,272	182	10	3	225	19	7	226	14	9
1818	81	2,388	1,844	207	9	6	268	5	6	165	18	9
1819	93	2,558	2,187	223	8	10	236	9	6	152	18	1
1820	140	2,494	2,221	211	15	10	241	6	6	123	7	5
1821	125	2,847	2,354	207	19	0	183	15	4	147	6	1
1822	215	2,411	2,013	199	11	7	177	17	7	169	0	1
1823	136	2,935	2,291	202	4	7	183	12	7	182	12	1
1824	154	2,868	2,503	204	11	9	202	1	4	185	2	6
1825	147	2,573	2,104	181	6	0	210	5	9	156	2	9
1826	152	3,240	2,888	172	5	1	235	11	7	93	16	3
1827	173	3,699	3,199	213	3	3	217	0	7	88	18	11
1828	178	3,478	3,028	184	7	4	237	6	6	35	19	9
1829	119	3,605	8,024	181	10	9	202	1	6	15	9	0
1830	191	3,225	2,846	284	7	2	274	2	7	25	13	7
1831	191	4,039	3,608	259	2	5	253	19	8	30	16	4
1832	204	3,859	3,459	265	13	1	273	4	4	23	9	1
1833	216	3,017	3,461	244	7	8	265	4	6	2	12	3
1834	174	3,298	2,866	205	0	4	234	16	10	..		
1835	139	2,900	2,624	342	16	3	288	12	0	94	6	10
1836	95	3,000	2,693	224	4	5	209	1	10	..		
1837	122	3,236	5,945	195	7	10	221	19	10	..		
1838	91	3,085	5,138	270	10	1	242	11	10	..		
1839	71	2,687	2,498	213	8	4	196	7	7	..		
1840	44	3,379	3,063	231	8	5	250	0	1	..		
1841	67	3,810	3,602	187	9	1	212	2	8	..		
1842	43	4,621	3,965	216	7	6	271	9	7	..		
1843	161	3,148	2,284	209	19	0	235	7	0	..		
1844	136	2,842	1,997	216	15	9	228	10	3	..		
1845	145	3,143	2,723	438	10	8	344	17	11	94	14	4
1846	85	3,058	2,803	264	19	6	236	15	3	122	18	7
1847	88	2,441	2,138	230	12	10	222	3	0	131	8	5
1848	100	1,853	1,647	235	3	11	195	9	9	171	2	7
1849	91	2,694	1,657	215	19	11	230	12	9	156	9	9

None vaccinated.

STATISTICAL TABLE showing the Diseases of 2,403 Patients, Registered on the Books of the Carlisle Dispensary from January 1, 1846, to January 1, 1847.

DISEASE.	Out Patients.		Home Patients.								
	Total Admitted.	Number Remaining.	Total Admitted.	Cured.	Relieved.	Irregular.	Died.	House Recovery.	Parish Surgeon.	No better.	Remaining.
I.—Febrile Diseases.											
Continued Fever	5	..	69	54	..	..	1	1	11	..	2
Infantile Remittent Fever	47	..	77	73	1	2	..	..	..	..	1
Catarrh and Influenza. .	148	3	202	99	..	2	..	..	4	..	7
Scarlet Fever	8	..	143	97	2	2	35	..	2	..	5
Small Pox . . . .	..	..	11	8	..	..	..	..	3	..	..
II.											
Diseases of Skin	105	3	20	17	..	1	1	..	..	..	1
III.—Injuries and Diseases of the Brain and Nervous System.											
Headache	30	1	11	8	..	..	..	..	..	..	3
Concussion of Brain . .	..	..	1	1	..	..	..	..	..	..	..
Water in the Brain . .	1	..	8	1	..	1	6	..	..	..	..
Palsy (Hemiplegia) and } Apoplexy	2	..	7	..	2	1	2	..	2	..	..
Epilepsy	2	..	..	..	..	..	..	..	..	..	..
Swimming of the Head .	7	..	1	1	..	..	..	..	..	..	..
Painful Affections of Nerves	12	..	4	3	1	..	..	..	..	..	..
Hypochondriacism . .	2	1	..	..	..	..	..	..	..	..	..
IV.											
Diseases of the Ear . .	5	..	..	..	..	..	..	..	..	..	..
V.											
Diseases of the Eye . .	27	1	6	3	..	2	..	..	..	..	1
VI.—Diseases of the Respiratory System.											
Croup . . . .	..	..	1	1	..	..	..	..	..	..	..
Asthma	4	..	4	..	3	..	1	..	..	..	..
Bronchial Inflammation .	57	2	34	22	9	..	1	..	1	..	1
Pleurisy	39	4	30	28	..	..	..	..	1	..	1
Painful Affections of Pleura } (Pleurodynia)	8	..	2	2	..	..	..	..	..	..	..
Inflammation of Lungs .	7	1	26	23	..	..	..	..	1	..	2
Spitting of Blood . . .	6	..	..	..	..	..	..	..	..	..	..
Consumption	16	3	20	..	4	..	10	..	5	1	..
VII.—Diseases of the Circulating System.											
Diseases of the Heart . .	13	2	9	1	4	..	3	..	1	..	..
Inflammation of the Pericardium . . . .	..	..	3	3	..	..	..	..	..	..	..
Varicose Veins	5	..	..	..	..	..	..	..	..	..	..
Dropsy	12	3	22	10	1	..	8	..	1	..	2
Senile Gangrene . . . .	..	..	1	..	..	..	..	..	..	..	1
VIII.—Diseases of the Organs of Digestion.											
Aphthæ	1	..	4	4	..	..	..	..	..	..	..
Ranula	1	..	..	..	..	..	..	..	..	..	..
Dentition (Difficult) . .	20	..	28	20	..	..	8	..	..	..	..
Quinsey	20	..	12	12	..	..	..	..	..	..	..

Statistical Table, showing the Diseases of 2,403 Patients, &c.—*continued.*

DISEASE.	Out Patients.		Home Patients.								
	Total Admitted.	Number Remaining.	Total Admitted.	Cured.	Relieved.	Irregular.	Died.	House Recovery.	Parish Surgeon.	No Better.	Remaining.
Inflammation of Stomach.	2	..	1	1	..	..	..	..	..	..	2
Indigestion	159	15	40	35	2	..	..	..	1	..	..
Constipation	43	..	12	13	..	..	..	..	..	..	..
Diarrhœa	99	2	66	66	..	..	..	..	..	..	..
Dysentery	48	..	45	45	..	..	..	..	..	..	..
Inflammation of Peritoneum	1	..	11	11	..	..	..	..	..	..	..
" Liver	17	3	5	2	2	..	..	..	1	..	..
Jaundice	8	..	4	3	..	..	..	..	1	..	..
Vomiting of Blood. . . . .	..	..	1	1	..	..	..	..	..	..	..
Hernia	5	..	3	..	2	..	1	..	..	..	..
Worms	30	1	3	3	..	..	..	..	..	..	..
Mesenteric Disease	1	..	2	2	..	..	..	..	..	..	..
Hæmorrhoids.	10	..	2	..	..	1	..	..	1	..	..
Debility.	7	1	5	3	..	..	..	..	2	..	..
IX.— <i>Diseases of the Genito-Urinary Organs.</i>											
Hysteric Disease	3	..	7	7	..	..	..	..	..	..	..
Uterine Disease	1	..	..	..	..	..	..	..	..	..	..
Whites	19	..	4	4	..	..	..	..	..	..	..
Disordered Menstruation	21	..	14	14	..	..	..	..	..	..	..
Abortion . . . . .	..	..	2	1	..	..	..	..	1	..	..
Diseases of Kidney and } Bladder }	5	..	4	3	..	..	1	..	..	..	..
Retention of Urine.	2	2	..	..	..	..	..	..	..	..	..
Venereal Disease	53	2	4	4	..	..	..	..	..	..	..
Syphilis.	49	2	8	7	..	1	..	..	..	..	..
X.											
Scrofula.	4	..	..	..	..	..	..	..	..	..	..
XI.											
Rheumatism	40	1	23	23	1	2	..	..	1	..	1
XII.											
Fractures, Burns, and other } Surgical Cases }	175	5	53	45	3	..	2	..	1	2	..
Total	1,412	58	991	784	37	15	80	1	41	3	30

Statement of the Registers.

The patients who have received the benefit of this Charity, from January 1, 1846, to January 1, 1847 (including 85 remaining last year), amount to 3,138. Of these there were—

Casualties or trivial cases cured	650
Patients recommended—cured	2,153
" " relieved	84
" " irregular	34
" " died	80
" " no better	5
Transferred to the House of Recovery	1
" to the parish surgeons	43
Remaining on the Books	88—3,138

Of Patients admitted this year, there were 1,052 Males; 1,351 Females.

370 were under 5 years of age.
194 were between 5 and 10 years.
349 " 10 " 20 "
472 " 20 " 30 "
342 " 30 " 40 "
289 " 40 " 50 "
225 " 50 " 60 "
167 " 60 and upwards.

991 patients have been attended at home this year.

TABLE showing the Diseases and Ages of the Patients who have died.

DISEASE.	Under 5 Years.	5 to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	Total.
Continued Fever . .	..	..	..	..	..	..	1	..	..	..	1
Scarlet Fever . . .	23	11	1	..	..	..	..	..	..	..	35
Diseases of Skin . .	1	..	..	..	..	..	..	..	..	..	1
Water in the Brain .	5	..	..	..	..	..	..	..	..	..	5
Palsy (Hemiplegia) .	..	..	1	..	..	..	..	..	..	..	1
Apoplexy . . . . .	..	..	..	..	..	1	..	..	..	..	1
Asthma . . . . .	..	..	..	..	..	..	..	1	..	..	1
Bronchial Inflammation	..	..	..	..	..	..	1	..	..	..	1
Consumption . . . .	..	1	2	4	2	..	1	..	..	..	10
Diseases of the Heart .	..	..	1	..	..	..	..	2	..	..	3
Dropsy . . . . .	..	1	..	2	..	1	..	3	..	..	7
Dentition (Difficult) .	8	..	..	..	..	..	..	..	..	..	8
Hernia . . . . .	..	..	..	..	..	..	..	1	..	..	1
Diseases of the Kidney } and Bladder . . . }	..	..	..	..	..	..	..	..	1	..	1
Diseases of the Spine .	1	1	..	..	..	..	..	..	..	..	2
Ovarian Dropsy . . .	..	..	..	..	..	..	..	1	..	..	1
Inflammation of the } Brain }	..	1	..	..	..	..	..	..	..	..	1
Total	38	15	5	6	2	2	3	8	1	..	80

STATISTICAL TABLE, showing the Diseases of 974 Patients, Registered on the Books of the Carlisle Dispensary from January 1, 1848, to January 1, 1849.

DISEASE.	Out Patients.		Home Patients.							
	Total Admitted.	Number Remaining.	Total Admitted.	Cured.	Relieved.	Irregular.	Died.	Parish Surgeon.	No Better.	Remaining.
I.—Febrile Diseases.										
Continued Fever	5	..	37	15	..	..	1	21	..	..
Infantile Remittent Fever . .	40	3	50	47	..	1	..	..	..	2
Catarrh	72	5	55	52	..	..	..	..	..	3
Influenza	8	..	6	6	..	..	..	..	..	..
Small Pox. . . . .	..	..	10	10	..	..	..	..	..	..
Measles . . . . .	..	..	1	1	..	..	..	..	..	..
II.										
Diseases of Skin	44	7	10	9	..	..	1	..	..	..
III.—Diseases of the Brain, and Nervous System.										
Headache	17	..	7	7	..	..	..	..	..	..
Inflammation of Brain . . .	1	1	2	1	..	..	1	..	..	..
Water in the Brain	1	..	4	2	..	..	1	..	..	1
Delirium Tremens	1	..	..	..	..	..	..	..	..	..
Palsy (Hemiplegia) and Apoplexy	1	..	3	1	1	..	1	..	..	..
Epilepsy	2	1	3	3	..	..	..	..	..	..
Insanity . . . . .	..	..	1	..	1	..	..	..	..	..
Swimming of the Head . . .	2	1	..	..	..	..	..	..	..	..
Painful Affection of Nerves .	3	..	1	1	..	..	..	..	..	..
Disease of Spine	1	1	1	..	..	..	1	..	..	..
Hypochondriacism	1	..	..	..	..	..	..	..	..	..
IV.										
Diseases of the Ear	2	..	..	..	..	..	..	..	..	..
V.										
Diseases of the Eye	13	1	4	3	1	..	..	..	..	..
VI.—Diseases of the Respiratory System.										
Asthma	2	1	1	..	1	..	..	..	..	..
Bronchial Inflammation . . .	37	6	12	10	2	..	..	..	..	..
Hooping Cough . . . . .	..	..	2	1	..	..	..	..	..	1
Pleurisy	23	4	16	16	..	..	..	..	..	..
Painful Affection of Pleura (Pleurodynia)	1	..	..	..	..	..	..	..	..	..
Inflammation of Lungs . . .	..	..	7	2	..	..	4	..	..	1
Consumption	9	1	6	..	4	1	1	..	..	..
VII.—Diseases of the Circulating System.										
Diseases of the Heart	6	2	4	2	2	..	..	..	..	..
Varicose Veins	1	..	..	..	..	..	..	..	..	..
Dropsy.	1	..	8	2	..	..	2	..	..	4
VIII.—Diseases of the Organs of Digestion.										
Aphthæ	2	..	..	..	..	..	..	..	..	..
Dentition	1	..	5	2	..	..	1	..	..	2
Quinsey	9	1	3	3	..	..	..	..	..	..
Indigestion	53	2	6	6	..	..	..	..	..	..
Constipation	4	..	1	1	..	..	..	..	..	..

Statistical Table, showing the Diseases of 974 Persons, &c.—continued.

DISEASE.	Out Patients.		Home Patients.							
	Total Admitted.	Number Remaining.	Total Admitted.	Cured.	Relieved.	Irregular.	Died.	Parish Surgeon.	No Better.	Remaining.
Diarrhœa	32	..	15	13	..	..	2	..	..	..
Dysentery	4	..	2	2	..	..	..	..	..	..
Inflammation of Bowels . . . . .	..	..	4	4	..	..	..	..	..	..
" Liver	3	1	1	1	..	..	..	..	..	..
Jaundice	2	..	1	..	1	..	..	..	..	..
Cholera (English) . . . . .	..	..	6	5	..	..	..	..	..	1
Hernia	6	..	1	..	1	..	..	..	..	..
Worms.	5	..	2	2	..	..	..	..	..	..
Mesenteric Disease . . . . .	..	..	4	1	..	..	3	..	..	..
Hæmorrhoids	2	1	..	..	..	..	..	..	..	..
Debility	8	2	6	4	1	..	1	..	..	..
Fistula	1	..	1	..	1	..	..	..	..	..
IX.—Diseases of the Genito-Urinary Organs.										
Hysteric Disease	3	1	1	1	..	..	..	..	..	..
Uterine Disease . . . . .	..	..	1	..	..	..	..	..	1	..
Whites	2	1	..	..	..	..	..	..	..	..
Disordered Menstruation.	6	1	4	2	..	..	..	1	..	1
Abortion . . . . .	..	..	2	2	..	..	..	..	..	..
Diseases of Kidney and Bladder	4	..	3	2	..	..	..	..	..	1
Retention of Urine	3	..	..	..	..	..	..	..	..	..
Venereal Disease (Urethritis)	39	8	3	3	..	..	..	..	..	..
Syphilis	26	7	8	6	..	..	..	1	..	1
X.										
Gout . . . . .	..	..	1	1	..	..	..	..	..	..
XI.										
Rheumatism	11	2	16	15	1	..	..	..	..	..
XII.										
Fractures, Burns, Abscesses, and other Surgical Cases	75	8	31	25	1	..	..	1	..	4
Total	595	69	379	292	18	2	20	24	1	22

Statement of the Registers.

The patients who have received the benefit of this Charity from January 1, 1849 (including 100 remaining last year), amount to 1,853. Of these there were—

Casualties or trivial cases cured	779
Patients recommended — cured	868
" " relieved.	44
" " irregular	15
" " died	22
" " no better	1
Transferred to the parochial surgeons	33
Remaining on the Books	91
—1,853	

Of 974 patients admitted this year, there were Males, 437; Females, 537.

113 were under 5 years of age.

76 were between 5 and 10 years.

197	„	10	„	20	„
201	„	20	„	30	„
129	„	30	„	40	„
131	„	40	„	50	„
76	„	50	„	60	„
51	„	60	and upwards.		

TABLE showing the Diseases and Ages of the Patients who have died.

DISEASE.	Under 5 Years.	5 to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Total.
Continued Fever. . . . .	..	..	..	..	..	..	..	1	..	1
Erysipelas . . . . .	..	..	1	..	..	..	..	..	..	1
Inflammation of Brain . . . . .	..	..	..	..	1	..	..	..	..	1
Water in the Brain	1	..	..	..	..	..	..	..	..	1
Apoplexy. . . . .	..	..	..	..	..	..	1	..	..	1
Disease of Spine. . . . .	..	..	1	..	..	..	..	..	..	1
Inflammation of Lungs.	3	1	..	..	..	..	..	..	..	4
Consumption. . . . .	..	..	..	1	..	..	..	..	..	1
Dropsy . . . . .	..	..	1	..	..	..	1	..	..	2
Difficult Dentition	1	..	..	..	..	..	..	..	..	1
Diarrhœa	2	..	..	..	..	..	..	..	..	2
Mesenteric Disease	3	..	..	..	..	..	..	..	..	3
Debility . . . . .	..	..	..	..	..	..	..	1	..	1
Total	10	1	3	1	1	..	2	2	..	20

STATISTICAL TABLE, showing the Diseases of 1,839 patients, Registered on the Books of the Carlisle Dispensary, from January 1, 1849, to January 1, 1850.

DISEASE.	Out-Patients.		Home Patients.							
	Total Admitted.	Number Remaining.	Total Admitted.	Cured.	Relieved.	Irregular.	Died.	Parish Surgeon.	No Better.	Remaining.
I.—Febrile Diseases.										
Continued Fever	5	..	20	15	..	..	..	3	..	2
Infantile Remittent Fever	35	1	62	59	..	..	2	..	..	1
Catarrh	133	11	40	38	..	..	..	..	..	2
Influenza	3	..	6	6	..	..	..	..	..	..
Scarlet Fever . . . . .	..	..	7	3	..	..	3	1	..	..
Measles	5	..	10	10	..	..	..	..	..	..
II.										
Diseases of Skin	89	9	20	19	..	..	..	..	..	1
III.—Diseases of the Brain and Nervous System.										
Headache	21	..	10	10	..	..	..	..	..	..
Inflammation of Brain . . . . .	..	..	7	5	..	..	2	..	..	..
Water in Brain . . . . .	..	..	3	..	..	..	3	..	..	..

Statistical Table, showing the Diseases of 1,839 Patients, &c.—continued.

DISEASE.	Out-Patients.		Home Patients.							
	Total Admitted.	Number Remaining.	Total Admitted.	Cured.	Relieved.	Irregular.	Died.	Parish Surgeon.	No Better.	Remaining.
Concussion of Brain . . .	..	..	2	2	..	..	..	..	..	..
Delirium Tremens . . .	..	..	1	1	..	..	..	..	..	..
Palsy (Hemiplegia) and Apoplexy	3	..	5	..	1	..	2	1	..	1
Epilepsy	2	..	1	..	1	..	..	..	..	..
Chorea	1	..	1	..	1	..	..	..	..	..
Convulsions . . . . .	..	..	2	..	..	..	2	..	..	..
Swimming of the Head . .	13	3	..	..	..	..	..	..	..	..
Painful Affection of Nerves .	12	1	3	3	..	..	..	..	..	..
Disease of Spine	1	..	1	..	..	..	..	1	..	..
Hypochondriacism . . .	5	..	2	1	1	..	..	..	..	..
IV.										
Diseases of the Ear . . .	8	..	3	3	..	..	..	..	..	..
V.										
Diseases of the Eye . . .	34	2	13	12	..	..	..	..	..	1
VI.—Diseases of the Respiratory System.										
Croup . . . . .	..	..	2	1	..	..	1	..	..	..
Asthma	6	3	4	..	4	..	..	..	..	..
Bronchial Inflammation . .	76	8	43	24	8	1	3	1	1	5
Whooping Cough	16	1	20	14	..	..	5	1	..	..
Pleurisy	5	..	12	11	..	1	..	..	..	..
Painful Affection of Pleura .	12	1	1	..	..	..	..	..	..	1
Inflammation of Lungs . .	..	..	9	8	..	..	1	..	..	..
Spitting of Blood	5	2	3	3	..	..	..	..	..	..
Consumption	1	..	7	..	1	..	4	1	..	1
VII.—Diseases of the Circulating System.										
Diseases of the Heart . . .	13	..	11	3	3	..	4	..	..	1
Varicose Veins	4	..	1	..	..	..	..	1	..	..
Dropsy . . . . .	..	..	8	6	..	..	..	2	..	..
VIII.—Diseases of the Organs of Digestion.										
Aphthæ	6	..	1	1	..	..	..	..	..	..
Difficult Dentition	22	1	16	9	..	..	5	1	..	1
Inflammation of Mouth . .	3	1	3	3	..	..	..	..	..	..
Quinsey	25	..	11	11	..	..	..	..	..	..
Indigestion	110	2	21	19	..	..	..	..	..	2
Colica	6	..	2	2	..	..	..	..	..	..
Constipation	22	2	6	6	..	..	..	..	..	..
Diarrhœa	89	2	58	50	1	..	4	1	..	2
Dysentery	8	..	9	5	..	..	..	1	..	3
Inflammation of Bowels . .	..	..	7	6	..	..	1	..	..	..
,, Liver	3	..	16	4	2	..	..	..	..	..
,, Peritoneum . . . .	..	..	8	7	..	..	..	..	..	1
Jaundice	3	..	2	2	..	..	..	..	..	..
Cholera (English)	1	..	9	9	..	..	..	..	..	..
,, (Asiatic) . . . . .	..	..	7	5	..	..	1	1	..	..
Hernia	2	..	1	..	1	..	..	..	..	..
Worms	23	..	8	8	..	..	..	..	..	..
Mesenteric Disease . . . .	..	..	4	..	..	..	3	..	..	1

Statistical Table, showing the Diseases of 1,839 Patients, &c.—*continued.*

DISEASE.	Out-Patients.		Home Patients.							
	Total Admitted.	Number Remaining.	Total Admitted.	Cured.	Relieved.	Irregular.	Died.	Parish Surgeon.	No Better.	Remaining.
Hemorrhoids	10	2	2	..	1	..	..	1	..	..
Fistula in Ano . . . . .	..	..	1	..	..	..	..	1	..	..
Debility	12	..	6	4	..	..	..	2	..	..
IX.— <i>Diseases of the Genito-Urinary Organs.</i>										
Hysteric Disease	9	..	9	7	..	..	..	..	..	2
Uterine Disease	1	..	5	..	4	..	..	1	..	..
Whites	4	..	..	..	..	..	..	..	..	..
Disordered Menstruation . .	30	2	15	14	..	..	..	1	..	..
Abortion . . . . .	..	..	7	7	..	..	..	..	..	..
Diseases of Kidney and Bladder	6	1	1	1	..	..	..	..	..	..
Retention of Urine	4	..	2	2	..	..	..	..	..	..
Venereal Disease (Urethritis) .	45	3	5	5	..	..	..	..	..	..
Syphilis	43	2	10	10	..	..	..	..	..	..
X.										
Scrofula	10	1	1	..	1	..	..	..	..	..
XI.										
Rheumatism	29	2	36	28	3	..	..	3	..	2
XII.										
Fractures, Burns, Abscesses, } and other Surgical Cases . }	133	7	53	44	1	1	1	3	..	3
Total	1,167	70	672	526	34	3	47	28	1	33

Statement of the Registers.

The patients who have received the benefit of this charity from January 1, 1849, to January 1, 1850 (including 91 remaining last year), amount to 2,694. Of these there were—

Casualties or trivial cases cured	764
Patients recommended—cured	1,657
,, ,, relieved	63
,, ,, irregular	23
,, ,, died	48
,, ,, no better	1
Transferred to the parochial surgeons	35
Remaining on the books	103

—2,694

Of 1,839 patients admitted this year, there were Males, 797; Females, 1,042.

290	were under 5 years of age.
119	were between 5 and 10 years.
247	,, 10 ,, 20 ,,
386	,, 20 ,, 30 ,,
262	,, 30 ,, 40 ,,
258	,, 40 ,, 50 ,,
150	,, 50 ,, 60 ,,
127	,, 60 and upwards.

TABLE showing the Diseases and Ages of the Patients who have died.

DISEASE.	Under 5 Years.	5 to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Total.
Infantile Remittent Fever . .	2	..	..	..	..	..	..	..	..	2
Scarlet Fever	2	1	..	..	..	..	..	..	..	3
Inflammation of the Brain . .	1	..	..	..	..	1	..	..	..	2
Water in the Brain	3	..	..	..	..	..	..	..	..	3
Palsy (Hemiplegia) and Apo- plexy . . . . .	..	..	..	..	..	..	2	..	..	2
Convulsions	2	..	..	..	..	..	..	..	..	2
Croup . . . . .	..	1	..	..	..	..	..	..	..	1
Bronchial Inflammation . . .	..	..	..	1	1	..	..	..	1	3
Hooping Cough	4	1	..	..	..	..	..	..	..	5
Inflammation of the Lungs . .	..	..	..	..	..	1	..	..	..	1
Consumption . . . . .	..	..	1	2	..	1	..	..	..	4
Disease of the Heart . . . . .	..	..	1	..	..	..	2	1	..	4
Difficult Dentition	5	..	..	..	..	..	..	..	..	5
Diarrhœa	5	..	..	..	..	..	..	..	..	5
Inflammation of the Bowels . .	1	..	..	..	..	..	..	..	..	1
Asiatic Cholera . . . . .	..	1	..	..	..	..	..	..	..	1
Mesenteric Disease . . . . .	..	2	1	..	..	..	..	..	..	3
Burn	1	..	..	..	..	..	..	..	..	1
Total	26	6	3	3	1	3	4	1	1	48

DISPENSARY. — STATEMENT OF ACCOUNTS.

<i>Dr.</i>	£	s.	d.
To Balance from 1848	171	2	7
Subscriptions, 1849	158	10	6
Donations	11	1	0
Apprentice fee, per Decimus Hodgson	5	5	0
Interest, per Canal Company	31	1	4
Interest per Investment in Savings' Bank	3	0	0
Interest per Thomas Pattinson's Executors	1	18	6
Interest per Banking Account	5	3	7

£387 2 6

To Balance 156 9 9

<i>Cr.</i>	£	s.	d.
By Drugs per W. R. Martindale and Son	17	14	6
Do. per Martha Fisher	17	12	6
Do. per John Sowerby	15	8	6
Do. per Richard Pattinson	11	12	0
Do. per Andrew Thompson	19	11	0
Spirits of Wine, per Joseph Hope and Son	17	6	0
Printing and Stationery	7	19	6
Sundry Small Disbursements	23	8	9

Carried forward £130 12 9

	£	s.	d.
Brought forward	130	12	9
Salary to Apothecary's Assistant	20	0	0
Salary to Apothecary	60	0	0
Gratuity to Apothecary	20	0	0
	<hr/>		
	230	12	9
By Balance	156	9	9
	<hr/>		
	£387	2	6
	<hr/>		

JOHN WALDIE, *Treasurer.*

Feb. 14, 1850.—Examined and found correct.

WM. REES, }
JOHN SOWERBY, } *Auditors.*

CARLISLE DISPENSARY.—At the annual meeting of the subscribers to the Dispensary held at the Town Hall, on Tuesday, the 19th February 1850, Joseph Rome, Esq., Mayor, in the Chair:

Moved by the Rev. E. Brown, and seconded by Robert Cowen, Esq.—

I. That the treasurer's statement of accounts and state of the registers be passed, printed, and distributed amongst the subscribers.

Moved by P. H. Howard, Esq., M. P., and seconded by Rev. W. Rees —

II. That the thanks of this meeting be given to Mr. William Halton, Mr. Cowen, Mr. Stordy, Mr. George Dixon, Mr. Thurnam, and Mr. J. D. Carr, the Quarterly Committee; and that the same gentlemen be requested to continue in office for the ensuing year.

Moved by Robert Cowen, Esq., seconded by Joseph Ferguson, Esq., Lowther Street —

III. That the cordial thanks of this meeting be given to Dr. Barnes, physician to the institution, and trusts that he will continue his services during the present year.

Moved by William Stordy, Esq., and seconded by Robert Cowen, Esq.—

IV. That the thanks of this meeting be presented to Rev. Mr. Rees and Mr. John Sowerby, auditors of the accounts; and that they be requested to continue their services for the present year.

Moved by Dr. Barnes, and seconded by W. Halton, Esq.—

V. That the thanks of the meeting be given to Mr. Waldie for his services as treasurer and secretary to the dispensary.

JOSEPH ROME, *Chairman.*

The Mayor having vacated the chair, it was resolved unanimously—

VI. That the thanks of this meeting be given to Mr. Rome for his proper conduct as chairman.

JOHN WALDIE, *Secretary.*

HOUSE OF RECOVERY, Twenty-ninth Report.

Statement of Accounts from December 1, 1848, to November 30, 1849.

Receipts.

	£.	s.	d.
Annual subscriptions	106	1	0
Donations	100	4	0
Cash on account of patients, including charges for bearers	6	7	9
Rent of lands and cottage	26	13	0
Dividends on stock	9	5	6
Interest on banking account	8	1	4
Cash produced by sale of wood and iron chain *	10	9	6
Balance due to the treasurer	29	3	6
	<hr/>		
	£ 296	5	7

Expenditure.

	£.	s.	d.
Balance of last year's account	27	16	5
House expenses, including provisions, wine, &c., for patients	24	5	4
Furniture, linen, &c.	0	11	0
Alterations and repairs of premises	166	10	3
Apothecary's salary	5	0	0
Inspector's do.	29	4	6
Do. for 4 patients admitted at 2s. 6d. each	0	10	0
Do. for bearers (included in the patients' account)	0	6	0
Nurses' wages	5	15	0
Drugs	1	11	0
Brushes for whitewashing	2	5	6
John Thompson, collecting subscriptions	1	1	0
Mrs. Graham, attending annual meeting and committee meetings	0	10	0
Stationery, printing, and advertising	12	10	0
Receipt stamps, postages, &c.	0	2	9
Mr. Coulson, half-year's interest on mortgage	15	15	0
Income tax on interest of mortgage	0	18	4
Insurance	1	8	6
Dean and Chapter, quit-rent	0	4	0
Earl Lonsdale, do.	0	1	0
	<hr/>		
	£ 296	5	7

3rd December, 1849. Examined and found correct,

WILLIAM STORDY, }
 JOS. RAILTON, } Auditors.

* Mr. Browne, auctioneer, made no charge for attending the sale.

ABSTRACT FROM THE LOCAL REPORT ON HOUSE OF
RECOVERY.

The following abstract will show to your Honourable Board the precautionary measures which have been taken to prevent disease; and it is gratifying to state that much benefit to the inhabitants has been the result.

“HOUSE OF RECOVERY.—The annual meeting of the subscribers to this institution was held at the Town Hall on Monday, December 3, 1849. The following gentlemen were present:—Joseph Rome, Esq., Mayor; W. Stordy, Esq.; R. Cowen, Esq.; P. Dixon, Esq.; T. Sheffield, Esq.; W. Halton, Esq.; the Rev. W. Rees; T. Lonsdale, Esq.; Dr. Barnes; Jos. Railton, Esq.; Mr. Thurnam; Mr. Waldie, &c.

“On the motion of the Rev. Mr. Rees, seconded by Mr. R. Cowen, “The Mayor was called to the Chair.

“The Secretary opened the proceedings by reading the minutes of the last committee meeting, after which he read the following report:—

“REPORT.—In the last annual report it was stated that cholera had again made its appearance in several places in this country, and that it would in all probability reach Carlisle. This anticipation was, unfortunately, soon realized. Several cases of the disease occurred here in January, and it was soon found indispensably necessary to have a cholera hospital, as, in the houses of the poor, the necessary means of cure could be obtained. The committee was also aware that when cholera appeared in Carlisle in the year 1832, much good had arisen from the use of the old fever-house as a cholera hospital. At that time 177 patients affected with the disease were admitted into the house. On the 12th of January last a meeting of the committee was called to meet a committee of the Board of Guardians, to consult as to the admission of cholera patients, when it was resolved that the house of recovery should be placed at the disposal of the Board of Guardians for the reception of patients afflicted with cholera, and that the Board of Guardians should put the house and premises, bedding and furniture, in the same state as to repair and cleanliness when they gave up possession as it was at that time. In accordance with these resolutions, an agreement was prepared by the secretary, and signed by the chairman of the Board of Guardians, on behalf the Board. The house was immediately transferred to them, and the wards thrown open for the reception of cholera patients. The Board held possession of the house, free of charge, from January 13 until March 17, during which time 74 patients were admitted, 58 affected with cholera, and 16 with typhus fever. When cholera prevailed in Carlisle on the former occasion, it seemed to supersede some other diseases, and particularly typhus fever. For six months the town was entirely free from fever, and only 14 cases of it were admitted into the fever-house during the following year. On this occasion also very few cases of fever have occurred, only 4 fever patients having been admitted during the last nine months, and 19 during the year.

“The following tables have been compiled from the register kept at the institution. They show the monthly admissions, deaths, and recoveries, of both cholera and fever patients:—

CHOLERA and CHOLEROID DIARRHŒA PATIENTS admitted in 1849.

1849	Admitted.			Died.			Recovered.		
	Males.	Females	Total.	Males.	Females	Total.	Males.	Females	Total.
January 13th to 31st inclusive .	5	9	14	2	2	4	3	7	10
February 1st to 28th	12	19	31	2	6	8	10	13	23
March 1st to 8th	8	5	13	2	0	2	6	5	11
Total	25	33	58	6	8	14	19	25	44

“ It appears from the above table that 14 persons died of cholera in the House of Recovery. The number of deaths from the same disease out of the house, as recorded by the registrar of the district, amounts to 43.

TYPHUS FEVER PATIENTS admitted in 1849.

1848-9	Admitted.			Died.			Recovered.		
	Males.	Females	Total.	Males.	Females	Total.	Males.	Females	Total.
December . . . . .	..	..	..	..	..	..	..	..	..
January	2	2	4	..	..	..	2	2	4
February	5	6	11	..	..	..	5	6	11
March . . . . .	..	1	1	..	..	..	..	1	1
April . . . . .	..	..	..	..	..	..	..	..	..
May	1	..	1	..	..	..	1	..	1
June . . . . .	..	..	..	..	..	..	..	..	..
July . . . . .	..	..	..	..	..	..	..	..	..
August . . . . .	..	..	..	..	..	..	..	..	..
September . . . . .	..	..	..	..	..	..	..	..	..
October	1	1	2	..	..	..	1	..	1
November . . . . .	..	..	..	..	..	..	..	..	..
Total	9	10	19	..	..	..	9	9	18

REMARKS ON TABLE.—“ It will be observed by the latter table that there have been no deaths from typhus fever during the year. One case of typhus remains in the house under treatment. In December a case of small-pox was admitted and was soon discharged cured.

“ The visitation of Asiatic cholera has been justly considered a great national calamity, and as it has now abated throughout the country, and in several towns as well as Carlisle has entirely ceased, it is very gratifying to observe that the gratitude of the nation for the abatement of this grievous scourge has been lately publicly testified by the general thanksgiving to Divine Providence. The inhabitants of Carlisle have much reason to be thankful. Compared with other places, and with our former visitation, Carlisle has been favourably dealt with. A few weeks ago two decided cases of cholera, which proved fatal, were imported from an infected district; but the disease did not spread in the town.

“ The committee beg to report that the alterations and improvements

recommended to be made in the out-buildings, at the last annual meeting, have been executed under the direction of a sub-committee, and the expense incurred has not amounted to more than the sum then estimated. Three additional wards, with lofty ceilings, have been made and fitted up for the accommodation of patients.

“ This institution having been established for the prevention as well as the cure of contagious fevers, the sanitary state of Carlisle has always formed one of its leading objects, and the committee hail with satisfaction the prospect there now is of great improvement in this respect being shortly made. The introduction of common sewers and better drainage, of an extra-urban cemetery or cemeteries, of a more efficient system of removing nuisances, and of cleansing the streets, lanes, and courts, and of other public sanitary measures, are well calculated to improve the health of the inhabitants, and to ward off severe and fatal epidemic diseases, such as cholera and typhus fever. And as Carlisle has been recently visited by an inspector sent by the General Board of Health in London, there is now every probability that this city will participate in the great benefits that the application of the Public Health Act is calculated to confer.

STATEMENT OF THE REGISTERS.

Patients admitted into and discharged from the Carlisle House of Recovery from Dec. 1st, 1848, to Dec. 1st, 1849.

Remaining in the house, Dec. 1st, 1848, affected with fever	0
Since admitted, affected with fever	19
Ditto ditto malignant cholera	58
Ditto ditto small-pox	1
	<hr/>
Total	78
	<hr/>

Discharged, cured of fever	18
Ditto ditto malignant cholera	44
Ditto ditto small-pox	1
Died of malignant cholera	14
Remaining, affected with fever	1
	<hr/>
Total	78
	<hr/>

Total number of patients admitted since the establishment of the hospital in 1820	2,622
Ditto in typhus fever ditto	2,269
Rooms whitewashed since Dec. 1, 1848	253
Where both lime and brushes have been supplied . .	102
Brushes alone	24

“ That the following gentlemen constitute the committee for the ensuing year, viz.:—R. Cowen, Esq.; P. Dixon, Esq.; J. Ferguson, Esq., Fisher-street; Wm. Halton, Esq.; Rev. C. V. Harcourt; G. H. Head, Esq.; Wm. Hodgson, Esq., Bowness; Mr. Railton; Rev. W. Rees; Wm. Stordy, Esq.; Mr. Sheffield; and Mr. Thurnam.

“ That the best thanks of this meeting are especially due to Dr. Barnes for his services as acting medical officer of the institution.

“ That the thanks of this meeting be given to the late committee for their services.

“ That the thanks of this meeting be given to Mr. H. J. Halton, secretary of the institution, for his services.

“ That the thanks of this meeting be given to Mr. Norman, the treasurer of the institution, for his services.

“ That the thanks of this meeting be given to Mr. Stordy and Mr. Railton for their attention in auditing the accounts.”

LIST OF STREETS AND PLACES WHERE CHOLERA HAS PREVAILED WITHIN THE CITY OF CARLISLE.—Willowholme; Paddenbeck; Union-street, Botchergate; Caldewgate; Duke-street, Caldewgate; Shaddongate; St. Mary's workhouse; Irish Damside; English Damside; Caldcoats.

The following Report, put in by the Sanitary Association, will exhibit the present state and condition of the city. From personal inspection I can vouch for its graphic accuracy. Dr. Lonsdale furnished me with every needful assistance and information during the inquiry. There is also the report of Dr. Reid, published by the Health of Towns Commissioners in 1843, to which I beg to refer for further information on this portion of the subject.

“ REPORT OF THE CARLISLE SANITARY ASSOCIATION.—The Committee of the Carlisle Sanitary Association having carefully examined the streets, lanes, alleys, and courts, and large numbers of the dwellings and workshops of the poorer classes in Carlisle, with a view to their sanitary improvement, beg to submit the following report to the consideration of the inhabitants.

“ Before entering upon the details of their inquiries made in each ward, the committee feel bound to express their extreme regret that Carlisle should present so much filth, and so many nuisances of the worst kind; the more especially as its site is in many respects well adapted for drainage and sewerage, and that the owners of property where the greatest nuisances prevail have it in their power to remedy many of the evils loudly complained of by the poorer classes who live in immediate contact with, and grievously suffer from the existence of, these nuisances.

“ The committee would be wanting in their duty to the artisan class if they failed to notice that many who are unfortunately obliged to live in dirty and otherwise objectionable tenements, are by no means so limited in their resources as to be considered entirely helpless in the cause of sanitary reform.

“ CALDEWEGATE WARD.—Many of the streets and smaller thoroughfares in this ward are imperfectly paved and swept. The lanes and courts are in a most objectionable state, containing almost invariably pigsties, open privies, dunghills, stagnant pools, the receptacles of every kind of filth; all which nuisances remain unheeded for weeks and months together. Some properties in this ward call for special notice—

Strong's-buildings, situate in Bridge-street and Willowholme, where most intolerable nuisances exist—damp miserable cellars, and dwellings above and on each side of most fearfully dirty privies. Everything in this range of buildings, containing more than 200 people, betokens the greatest filth and physical degradation: and here fever committed sad ravages during last autumn. Caldcoats presents dilapidated premises, numerous pigsties, and disgusting necessities; and between the canal gates and Bread-street there are overflowing cesspools and stagnant ditches, intersecting half an acre of waste land, and other nuisances, which are grievously complained of by a large neighbourhood. In Church-street the large open drain is very offensive. In Bridge-street the lanes are in a deplorable state of filth; in one of these eight pigsties, cowhouses, and large pools of stagnant noxious fluid. In the Willowholme, the Saddle-lane, the road to Armstrong's property, Jane-street, and Chapel-lane, and a farm yard close to the river Caldew, with 14 pigsties, demand the immediate attention of the proprietors.

"The committee would beg attention to 'Dotterill's-buildings' and 'the Barracks,' John-street, Caldewgate, and a property in Brewery-row, where there is only one privy for 20 families, and this has not been cleaned out since built. The properties in Rigg-street, Broad-guards, and Queen-street are sadly in need of thoroughcleansing.

"No greater fact has come before the notice of the committee in showing the value of sanitary measures than that afforded by Duke-street, Shaddongate. At the east end, and where the premises are in a filthy state, great complaints are made of the offensive effluvia and frequency of sickness. At the west end, where 57 families (306 people in all) reside in whitewashed and otherwise clean houses, which are carefully inspected by the proprietors twice a-year, only one case of fever occurred during last autumn.

"**ST. MARY'S WARD.**—The committee have too much reason to complain of the general state of this ward. Stoddart's court, in Abbey-street, is in the worst possible condition, whilst that part of Ritson's-lane* still remaining, Pipery-lane, Irishgate-brow, and Damside, and the lanes and yards in Annetwell-street, stand greatly in need of improvement.

"The committee regret to find that the numerous nuisances in Blue Bell-lane, Scotch-street, to which public attention was called last summer, still exist, and that there is in several lanes not specified above a sad deficiency of conveniences for the inhabitants, and a general want of cleanliness.

"The committee would beg to call the attention of the Corporation to the open and highly offensive drains bordering the Castle-bank and Bitts, and to the necessity of removing the manure-heaps at the bottom of Finkle-street, the emanations from which are much complained of by residents in the neighbourhood.

"**ST. CUTHBERT'S WARD.**—The paying of the streets in this ward is generally bad, and the scavenging faulty, and a still worse state of things prevails in the lanes and courts. The great want of necessities and suitable depôts for dirt is observed everywhere in this ward. Amongst

* Thirty cases of fever occurred under one roof in this lane last summer.

other nuisances the committee feel bound to notice the Bakehouse-yard, St. Cuthbert's-lane, where overcrowded houses in close proximity to wretchedly kept privies and ash-pits, are fruitful sources of fever. Some ash-pits and privies exposed to the open street of Blackfriars, as also a guano warehouse, are much complained of; Matthew's-court, in this street, is likewise in a very bad state. The 'Old Factory,' in Backhouse's-walk, is most disgraceful. The lanes on the east side of English-street are in a faulty condition, especially Old Grapes-lane and Peascod's-lane, into the latter of which a drain runs from a slaughterhouse; there is likewise an open cellar, a receptacle for filth, stated not to have been emptied for the last three years. In a yard in King's Arms-lane is a covered pit, into which is thrown the offal from an adjoining slaughterhouse; and Packhorse-lane contains different nuisances. In the Cockpit-yard, Lowther-street, are pigsties and other intolerable nuisances, which appear to have been unattended to for years.

"**RICKERGATE WARD.**—The committee can hardly find words to express the amount of filth, or to depict the abominable nuisances existing in this ward. The lanes on the east side of Scotch-street, those in Rickergate, and East Tower-street, Drover's and Lawson's-lane, Moffat's-yard, in Lowther-street, a lane in Finkle-street, and Castle-lane, are, without exception, dirty, and some of them quite intolerable. In Earl-street an open drain of the most offensive kind is loudly complained of by the people in the neighbourhood.

"Fever has found numerous victims in East Tower-street and Drover's-lane, and the adjacent lanes—a fact by no means surprising when it is known that in Moffat's-yard there is only one privy for 28 families, other properties being without conveniences at all, and in some of the lodging-houses more than 20 people are living in one room, and that adjacent to the filthiest privies and dunghills.

"**BOTCHERGATE WARD.**—In this ward the committee find a repetition of the nuisances already specified as existing in other wards. On the east side of Botchergate are open drains, of great extent and of a most offensive nature, being the receptacle of all kinds of filth. In the lower part of Botchergate, as in Union-street, the existence of these stagnant drains renders the air most unwholesome. Nothing can be more faulty than the drain from Botchergate across the meadows towards the Petteril. Loud complaints are made by the inhabitants against this source of pestilence, and also the large manure heaps on the line of road to Botcherby, the emanations from which not only interfere with the pleasantness of a walk much frequented by the citizens, but are sources of annoyance to those who live in the adjacent neighbourhood.

"The committee would fain hope that many of the owners of property where such objectionable circumstances exist as have been mentioned above, are not aware of the condition of their tenements, or they would have taken suitable steps to render them fit habitations for human beings.

"The committee are unanimously of opinion—

"1. That Carlisle stands greatly in need of drainage and sewerage, of better paving and scavenging.*

* It is well to bear in mind, that the purity of the atmosphere in the lanes and courts mainly depends upon the mode in which the great thoroughfares are kept.

“ 2. That the dwellings of the poor are too few in number, and of faulty construction, being erected apparently with the view of having the greatest number in the smallest possible space, and without any regard to ventilation, drainage, and the necessary conveniences of life.

“ 3. That immediate steps should be taken by joint stock companies, or otherwise, to erect more dwellings for the artisan class, in situations favourable for carrying out approved sanitary principles.

“ 4. That, as the weaving shops are very faulty in their arrangements, and as their proximity to the residences of the workmen is on many accounts objectionable, it seems advisable to consider if these workshops could not be erected on a better plan.

“ 5. That the dwellings of the poor are lamentably deficient of privies and other necessary conveniences, the absence of which leads to frequent altercations among the inhabitants, no less than a total disregard to the common decencies of life.

“ 6. That typhus fever and other diseases of an epidemic and fatal character prevail most in those parts of Carlisle where the dwellings are much overcrowded, and where least attention is paid to cleanliness and ventilation.

“ 7. That the inhabitants of lanes and other crowded localities be earnestly requested to whitewash their dwellings twice a-year, and to make free use of water upon the pavement and channels at least three times weekly.

“ 8. That the crowded state of the churchyards in the centre of the town is highly objectionable, and that the establishment of a public cemetery beyond the suburbs is imperatively called for.

“ 9. That the erection of public baths, suited to all classes, and of washhouses in each of the suburban districts would add materially to the health and comforts of the humbler classes, numbers of whom have expressed their willingness to support such establishments.

“ 10. That closed ash-pits and the frequent removal of the contents of these, and of privies, along with a plentiful supply of water to each yard and each dwelling of the poor are of the greatest importance.

“ 11. That the absence of sanitary measures in Carlisle has led to the constant development as well as dissemination of fever, to a greatly increased pauperism, and a necessarily increased poor-rate.

“ The committee would beg especial attention to the following fact in the history of Carlisle :—

“ In the assurance tables of this country the rate of mortality in Carlisle, within the last 20 years, used to be estimated at 1 in 54 of the inhabitants, being lower than the present average of the 15 *healthiest* counties in this kingdom. Now, in 1841, it was 1 in 39, being actually higher than that of the average of the 15 *unhealthiest* counties. If, as is now admitted, the healthy and natural standard of mortality in

In Carlisle, the streets run principally in one direction, from north to south, so that a thorough ventilation of the town can hardly be accomplished—hence every precaution is needed to secure well cleansed streets.

England and Wales is 2 *per cent. per annum*, or 1 in 50, it is evident that Carlisle, with its rate of mortality 1 in 39, or more than $2\frac{2}{3}$ *per cent. per annum*, stands greatly in need of sanitary improvement.

“The mortality during last year (1847) was greatly increased. In St. Mary’s district it could not be less than 1 in 25. Orphanage and widowhood, the accompanying results of this high mortality, have inflicted a heavy burden upon the rate-payers.

“The committee, relying upon the potency of the foregoing facts in exemplifying the unhealthy state of the town, feel assured that they have only to appeal to the energetic and active citizens of every class in Carlisle for their earnest aid and co-operation in so good a cause as sanitary reform—a cause which, aiming at the prevention of disease, is entitled to the support of those who contribute to our medical and other charities—a cause which, inculcating upon all habits of temperance, order, cleanliness, and economy, seeks to lessen the physical evils of man, whilst it tends to promote his moral and intellectual welfare, has the highest claims upon the economist, the philanthropist, and the friends of education and religion.

(Signed)

“HENRY LONSDALE, M.D.,
Honorary Secretary.”

“Carlisle, January 7, 1848.

TABLE of existing STREET SEWERS and DRAINS.

	High.	Wide.
	Ft. In.	Ft. In.
Scotch-street drain . . .	2 4	1 4
Fisher-street drain . . .	1 6	1 2
Lowther-street drain . . .	1 8	1 3
Victoria-place drain . . .	2 0	1 6
Chapel-street drain . . .	1 6	1 3
Cavendish-place drain . . .	2 6	1 6
Aglionby-lands drain . . .	2 0	1 6

These sewers are neither connected on plan or regular in form; some are square on section, others have a V shaped invert; all are, however, inefficient for the purpose of removing any refuse which may be passed into them, and they open out or discharge their contents so as to be an injury and nuisance to that particular neighbourhood where they terminate.

I have described a proper system of sewers and drains in another part of this report.

REMARKS ON HOUSE ACCOMMODATION.—The working classes in Carlisle live almost entirely in “lanes” or passages between the principal and secondary streets. Courts and alleys they would be termed in other places. Many of these lanes are entered by a covered passage, and some are closed at one end, forming a *cul de sac*. They are in general only a few yards in width. In some the doors are opposite each other, and are not more than three yards apart; others have houses on one side alone, a high dead wall, forming the backs of the houses in the next lane; rising on the opposite side. This arrangement obstructs light and free ventilation. In many instances there is only one

privy to a whole lane, and this is ruinous and filthy. In some lanes privies and middens are crowded amongst the houses, and not unfrequently under the same roof. They are in contact with a dwelling-house on each side, and have living and sleeping-rooms above and over them. The infiltration from the middens and liquid refuse in contact with the wall in some instances passes through, to the great inconvenience of the adjoining occupants.

It has been asserted that from nine to ten thousand persons in Carlisle reside in the lanes, courts and alleys so situated. Some of the cottages are in single rows, but more have the back-to-back arrangement; that is, the centre partition wall divides two sets of tenements; but those which are built single have all the faults of the double structures, as there are no windows or openings for ventilation in the back or side walls.

These houses are let off in room tenements, having one common stair to several tenancies. This is generally of stone. Many of these tenements are exceedingly faulty in all their means of ventilation; either the windows do not open, or only one "pane" or square can be opened, or the bottom sash alone can be raised. This does not allow of any regular change of air at the ceiling, and consequently ventilation is most imperfectly carried out.

REMARKS BY DR. ELLIOT, *on the evil arising from Open Drains and Stagnant Refuse in Ditches, near the City.*

The doctor remarked as follows, on the evil arising from open drains and sewers encompassing the town and passing through the suburbs. "There is an open drain commencing close behind the Crescent, it passes east, at the back of the houses in Botcher-gate, takes an irregular course eastward, under the new Warwick road, and then falls into the Petteril. This drain receives all the refuse of the district through which it passes, and is open, excepting where it crosses a road, throughout its whole length, and necessarily evaporates deleterious gases from its entire surface. There is also a natural stream passes at present through Caldewgate, and is turned at right angles down the south side of this street into the Little Caldew above the bridge. This water-course, also, serves in a measure to drain the district. Refuse of all sorts is thrown into it, and, being open through most of its course, the nuisance is very great at all times. But in summer, when the stream is low, it is very foul; and during rain it floods all the district, backing the refuse deposited upon its banks and margin upon, and at times into, the adjoining houses; although in the condition described many of the inhabitants use the water of the Little Taldew for their household purposes, as also from the Caldew. There are several drains and sewers open out on to the meadows

north of the Castle, and are offensive at all times to persons walking there.

“The entire length of open drains and water-courses receiving refuse may be about as under:—

	Lineal Yards.
Botchergate drain	1,760
Caldewgate drain	660
Borough mill-dam	2,420
Little Caldewgate drain	4,400
Fisher-street drain	330
Rickergate to river	220
	<hr/>
	9,790
	<hr/>

“Area of objectionable open drainage:

	Yds.	Yds.	Area.	Yds.	Ft.
Botchergate drain	1,760	$\times 1\frac{1}{3}$	=	2,346	2
Fisher-street drain	330	$\times 1$	=	330	0
Rickergate drains	220	$\times 1$	=	220	0
				<hr/>	
Square yards				2,896	2
				<hr/>	

“This would form a pond or reservoir of vitiated refuse 57 yards long by 50 yards wide, from the whole surface of which noxious gases must necessarily be evolved, to an extent highly offensive and injurious to health, acting as a powerfully predisposing cause to epidemic disease.”

RETURN OF COMMON LODGING-HOUSES.

Name of Street.	Number of Common Lodging-houses.
Botchergate, courts and lanes adjoining .	17
English-street	4
East Tower-street	14
Scotch-street	12
Rickergate	12
Caldewgate	13
Total number	<hr/> 72

Remarks on common Lodging-houses, with Observations, Suggestions, and Recommendations.—If the number of inmates in each of these lodging-houses is estimated at five each night, there will be 360 men, women, and children sleeping habitually within the city, without any means of observing the rules of decency. Common lodging-houses are the same in character and effect throughout the length and breadth of the country; they constitute one huge forcing-bed for the generation of vice, in all

its forms; and it will ever be in vain to erect workhouses, gaols, and hospitals, or to establish penal colonies for the punishment, reformation, or for the suppression of vice, if these places, which constitute the fountain-head of all that is depraved, are left unregulated. It is like assenting to a sowing of the seed, but objecting afterwards to the crop, and at vast danger, trouble, expense, and indignation, striving to uproot it. The following brief description may serve for all. Several beds are placed in one room, without the slightest attempt at isolation or separation. Many of the beds touch each other, and the males habitually strip themselves naked for the night. They pay 3*d.* each inmate for lodgings, so that 4*l.* 10*s.* nightly must be thus expended in Carlisle, or 1,642*l.* 10*s.* annually. On certain occasions these places are crowded to excess; and I have little doubt but that double the amount put down is expended, if not much more. To regulate these common lodging-houses without providing some means of accommodation, or setting some example of improved lodging-house, will however merely be an act of oppression. The poor cannot here help themselves; for purposes of self-improvement in this respect they are powerless; and it will some time or other be understood that poverty ought not to be exposed to vice so debasing and so contagious. The model lodging-houses in London furnish each single person with a separate apartment and bed; males and females have separate houses or rooms. Married couples have proper accommodation; and the ordinary lodging-house charge is found to pay for superintendence and interest on the capital laid out, and such, no doubt, would be the case in Carlisle.

Crime is in a measure self-generating in places where human beings are indiscriminately crowded. One vicious person infects the whole. Imitation produces emulation even in vice.

RETURN OF THE NUMBER OF SLAUGHTER-HOUSES WITHIN THE BOROUGH.—There are 18 slaughter-houses in the city, generally crowded amongst dwelling-houses, without proper means of drainage, or of preventing them being a nuisance to the neighbourhood. Slaughter-houses cannot be continued in crowded districts under any arrangements, and not be in some measure a nuisance. To free the inhabitants from this form of inconvenience and danger to health, proper slaughter-houses will have to be provided, where drainage and means of perfect ventilation can be formed; a full water supply to them will be required. All the internal portions of a slaughter-house ought to be composed of material which may be daily washed. Glazed brick, set in cement, will make the best walls, and fire bricks, set on edge in cement, will make a good floor. All the upper portion of the rooms should be lime-washed, at short intervals; all garbage should be removed daily. Ventilation should be

abundant and free, by means of a continuous slit-like opening, at or near the ceiling or ridge.

CRIMINAL AND MISCELLANEOUS STATISTICAL RETURNS OF THE CARLISLE POLICE FORCE, FOR THE YEAR 1848.

Returns of this character are more intimately connected with sanitary questions than some persons may, at a first glance, consider them. I have, however, tried to explain this. It may be adopted as a rule, that the districts most neglected in sanitary works and regulations, contain crime and vice in excess, if they do not also generate and foster it.

Abstract from Chief Constable's Report.—"The returns now submitted show an increase in the total number of apprehensions, as compared with 1847, of 43 males and 32 females.

"There is an increase of four males charged with assaulting the police.

"The common assaults and obstructing the officers in the execution of their duty are nearly equal to the report for the year 1847.

"There have been seven persons apprehended for burglary during the year, four of whom were committed for two burglaries in the borough, and the remaining three in the country, but all were apprehended by the police.

"The sum of 92*l.* 17*s.* 11*d.* has been taken from persons found drunk and incapable in the street, and restored to them when sober, and of which amount it is probable that the greater portion would have been stolen except for the interference of the police.

"Upon the whole I can undertake to report that the total increase of apprehension is owing to drunkenness and want of employment.

"The borough is in a peaceable and orderly state, and the police are performing their duties with much vigilance, efficiency, great forbearance, and kindness of manner.

"Two persons were apprehended, charged with committing a robbery in a jeweller's shop in Whitehaven to the amount of 50*l.*, the whole of which was found and restored to the owner by the police of this borough, and the two prisoners were sentenced to seven years' transportation each."

TABLE of OFFENCES committed by PERSONS taken into CUSTODY in 1848.

OFFENCES.	Total in the Year 1848.		
	M. & F.	Male.	Fem.
Offences against the Person—			
Highway Robbery	2	2	..
Concealing Births of Infants	1	..	1
Bigamy	2	2	..
Assaults, Common	8	7	1
„ on Police	27	27	..
Obstructing Police Constable on Duty .	6	6	..
Offences against Property committed with Violence—			
Burglary	7	7	..
Robbing	4	4	..
Assaults with intent to Rob	5	5	..

Table of Offences committed by Persons taken into Custody in 1848—*continued.*

OFFENCES.	Total in the Year 1848.		
	M. & F.	Male.	Fem.
Offences against Property committed without Violence—			
Larceny in a Dwelling-house	22	15	7
„ from the Person	30	12	18
Obtaining Goods under false pretences .	2	2	..
Embezzlement	1	1	..
Receiving Stolen Goods	1	1	..
Stealing	12	10	2
Charged on suspicion	14	12	2
Malicious Offences against Property—			
Arson	1	1	..
Wilful Damage	3	3	..
Offences against the Currency—			
Forging and Uttering Forged Instruments	2	2	..
Passing Counterfeit Coin	3	1	2
Offences not included in the above Classes—			
Cruelty to Animals	1	1	..
Deserting their Families	1	1	..
Deserters from Her Majesty's Service .	5	5	..
Drunk and Disorderly Characters . . .	251	184	67
Drunkenness	72	59	13
Vagrants	20	17	3
Drunk and exposing Person	1	1	..
Gambling	4	4	..
Absconding from Workhouse, &c. . . .	13	13	..
Total	521	405	116

TABLE showing the NUMBER of SUMMONSES granted by the COURT for the under mentioned OFFENCES, and how disposed of, commencing January 1, 1848, and ending December 31, 1848.

OFFENCES.	Total.	Sum- marily Con- victed.	Dis- missed.	Neither Party ap- peared.	Amica- bly ar- ranged.	Not found.	War- rants granted.
Assaults, Common	21	8	6	4	3	..	..
Wages disputed between Master and Servant . . . }	..	..	..	..	..	..	..
Neglecting to perform Work	2	..	..	..	2	..	..
Wilful Damage . . . . .	..	..	..	..	..	..	..
Threats, so as to place in bodily fear . . . . . }	..	..	..	..	..	..	..
Nuisances and Offences against Bye-laws . . . }	59	21	38	..	..	..	..
Breach of the Peace . . . . .	..	..	..	..	..	..	..
Bastardy . . . . .	..	..	..	..	..	..	..
Miscellaneous	4	..	2	..	2	..	..
Beer-houses	12	3	9	..	..	..	..
Ale-houses	16	2	14	..	..	..	..
Total	114	34	69	4	7	..	..

	£.	s.	d.
Amount of money taken from drunken persons when searched at the station-house, and re- stored when sober	92	17	11

No. 7.

	£.	s.	d.
Amount of property stolen	189	4	11
Amount recovered by the Police, and restored to the Owners	124	5	5
Deficiency	64	19	6

NUMBER of VAGRANTS who have been Relieved with a BED, and passed through the BOROUGH, during the Year 1849.

Males.

Number	4,285
Passed and relieved during day	141
Males	4,426
Females	1,299
Total	5,725

Females.

Number	1,127
Passed and relieved during day	172
Females	1,299

REMARKS ON VAGRANTS—*with Observations, Suggestions, and Recommendations.*

This latter Table is deserving of most serious consideration, *nearly six thousand vagrants (5,725, male and female) have been relieved with a bed, and passed through the borough in one year.* How many have passed without such relief, and consequently have not come under the cognizance of the police, is not stated. But there are the questions—Where did these vagrants come from, and where do they go to? It is also a problem of deep import to the community at large—How do they live? For most assuredly they are maintained by the honest and industrious portion of the community either directly or indirectly, if the mode could be shown; and the probability is, that if society expended half the sum annually upon works of improvement and amelioration, more than half the present misery and crime would be remedied.

It would serve a most useful purpose if the police registered daily (as far as practicable) the whole number of vagrants who pass through the city, as also the number of inmates staying

nightly in the common lodging-houses, as also what is done with food and clothes given them by the charitable, with an estimate of the sums paid by them for lodgings, and otherwise expended. Such returns, rightly studied, must lead to improvement. The police could reveal some very curious and startling facts respecting the schemes and practices of professional vagrants. They would inform the Corporation how that vagrancy is a systemized trade, or rather profession; founded, in every branch, upon falsehood, deceit, and fraud. The professional vagrant is beggar and thief by turns, as it may suit his or her purpose, but always an imposter of the worst kind, as he converts the pure stream of charity into the means of sin and corruption. The police could further explain how that maps of districts are drawn up for use; how that the charitable are catalogued, and their daily value skilfully estimated; how that such maps and catalogues are furnished, for a consideration, by the persons who keep them; and also, how that each house is daily marked, by the beggars first out, with a hieroglyphic for the guidance and instruction of the initiated, so that those who follow them know exactly upon what tact to act; whether they are to be importunate, or pass on, toll having been already levied up to the estimated amount for that day.

Indiscriminate almsgiving has been frequently denounced. The humane should learn that it is rarely beneficial. It frequently fosters vagrancy and encourages vice. The truly deserving, if they ever solicit charity, are never complaining, whining, or importunate. Where almsgiving is resorted to, the charitable should search out deserving objects, or entrust their wealth to those who will do so. It requires personal labour, industry, and diligence to do good. To give to the undeserving, is to foster iniquity and crime in their worst forms.

As sobriety is necessarily connected with the comfort of the working classes, I beg to present for consideration the following

ABSTRACT FROM THE TWELFTH ANNUAL REPORT OF THE CARLISLE
TOTAL ABSTINENCE SOCIETY, 1848.

“Your Committee, in presenting their Twelfth Annual Report, would congratulate the members of the Total Abstinence Association of Carlisle upon the success which has attended their labours during the past year, believing, as they do, that the temperance principle never had a firmer hold of the public mind than at present. Truly lamentable is it to witness the amount of intemperance in the present day, and to have continually brought before us the effects resulting therefrom; it is, nevertheless, pleasing to contemplate the gradual progress of the temperance cause, which will, they trust, one day effect the great object it has in view—the entire banishment of intemperance.

“Your Committee, in endeavouring to awaken in the public mind a further earnestness in the temperance movement, as well as to impress more forcibly the great though terrible truths forced upon them by

intemperance, have, during the past year, engaged the services of some of the most able advocates; and altogether 25 lectures (including 10 by E. P. Hood) have been delivered in Carlisle.

"The number of signatures to the pledge has been 278: men, 217; women, 61.

"There are in the city 116 public-houses, 21 beer-shops, 18 wine and spirit merchants, and 3 maltsters and brewers.

"Your Committee beg leave to call your attention to the accompanying statement of accounts, by which it will be seen that it has become necessary to make a strong appeal to the wise and good who wish to see the moral elevation, the intellectual improvement, and the social well-being of all orders amongst us.

"Truly the cause of temperance is a noble one; it is to win the fallen victims of vice back to the paths of virtue and morality. It is to give joy and gladness to many a home made dark and cheerless by the invader Drunkenness. It is to raise the prostrate energies of thousands to their original usefulness, and to give light and beauty to scenes now gloomy by the awful shadows of degradation and sin."

Treasurer in Account with the Carlisle Temperance Association.

Dr.	£.	s.	d.
To balance from last year . . .	9	0	11½
Members' subscriptions . . .	1	1	6½
Cards of membership sold . . .	1	0	10
Use of tea urn . . .	1	6	6
Yearly subscriptions and donations .	22	14	5
Cash received at lectures and tea party	46	3	5
Youths' society . . .	0	5	0
Balance due Treasurer . . .	8	0	0

£89 12 8

Cr.	£.	s.	d.
By lectures . . .	55	7	8½
Tracts, cards, printing, &c. . .	15	6	11½
Advertising . . .	1	3	0
Rent: committee room . . .	1	0	0
Missionary . . .	8	0	0
Ministers' convention . . .	1	0	0
Posting bills, &c. . .	2	15	0
Use of tabernacle . . .	5	0	0

£89 12 8

By balance to next year . . .	8	0	0
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(Signed) J. D. CARR, *Treasurer.*

Audited and found correct, { JAMES HUGGON.
Wm. R. COWAN.

COMPARATIVE TABLE, showing the TEMPERANCE CONDITION of the TOWNS named.

TOWNS.	Population.	Public Houses and Spirit Vaults.	Proportion to Number of Inhabitants.
Hull . . .	70,000	304	1 to 230
Liverpool . .	400,000	1,450	1 ,, 275
Warrington . .	26,000	85	1 ,, 305
Preston . . .	65,000	176	1 ,, 369
Wigan . . .	30,000	97	1 ,, 309
Oldham . . .	60,000	113	1 ,, 530
Birmingham .	200,000	550	1 ,, 363
Bolton . . .	65,000	308	1 ,, 211
Carlisle . . .	26,000	145	1 ,, 180

The first are given on the authority of Mr. Taylor, Borough Coroner for Bolton, as reported in the "Bolton Chronicle," August 25, 1849.

(Signed)

ROBERT LONSDALE, M.D.

~~Henry~~

WATER SUPPLY.—*Remarks, Observations, and Suggestions.*—

The city is at present supplied with water by a pumping-engine, which raises the water from the river Eden, as detailed in the abstract from the engineer's prospectus. The gentlemen who formed themselves into a company had the benefit of their poorer neighbours more at heart than any wish to make an immediate income; and the case of Carlisle may be cited as an example to other towns. An abstract of the last annual meeting, with the capital and revenue accounts, will show that the works are paying a satisfactory dividend. The remarks of Mr. Steel and Mr. J. Dixon are worthy of special attention, as regards the beneficial results experienced in the improved health of the inhabitants. The remarks of Mr. Carr convey information as to the value of the water for engine power, which experience has also confirmed in other places. With sewers and drains, each tenement, if not each room, may with singular advantage and economy have its separate pipe and tap. All labour in carrying water will thus be saved to the inhabitants, and undue waste will almost be impossible. A pipe and screw-down tap may be taken into each cottage, or room tenement, at a first cost of five shillings. This is the charge made by the Wolverhampton Water-Works Company to all their cottage tenants.

The Corporation may with advantage purchase the water-works for the benefit of the town, as one establishment would manage and superintend sewers, water supply, gas, cleansing, and regulating; and house-drainage and house-supply could then be carried out simultaneously with economy, the first cost being charged as a rental, in the form of a private improvement rate, rather than compelling each owner to pay down the whole sum at once, which has been found most oppressive in places where the Public Health Act has not been applied.

The advantages of a constant service of water are so great

that it ought to supersede every other form of supply. Even where pumps have been erected it is an extravagance to use them, if water can be obtained from the works, supposing both waters equally pure, which, however, they are not. Shallow wells in a town are liable to be impregnated with the contents of cesspools, sewers, and grave-yards; and such, according to scientific testimony, is the case with the well and pump-water of Carlisle; as Dr. Murray, Professor of Chemistry, in Edinburgh, when delivering a course of lectures in Carlisle, thus spoke:—

“That the common well-water used in Carlisle was scarcely fit to be used by the lowest class of animals! Several experiments he had tried since he came to the town had failed, owing to the extreme impurity of the water. In the water from the pump in the Fish-market, the saline matter is as 1 to 350; and in the pump at the Lion and Lamb, as 1 in 477. No water is fit for drinking, but is, in fact, pernicious to health, which contains more than 1 in 1,000 of saline matter.”

Mr. Steel also stated in evidence that—

“The former mode of supplying the town was by pumps, and by carts carrying barrels. The carters charged one halfpenny for two tins-full, holding about four gallons, or 6*d.* per cask of 100 gallons. At first we had some difficulty in inducing people to dispense with private pumps. Our present revenue amounts to nearly 1,400*l.* a year for what we supply. There was, on the establishment of the works, coldness or indifference, rather than opposition to us.”

As the best description of the water-works, I have embodied the following abstract from Mr. Simpson's Prospectus:—

ABSTRACT FROM MR. SIMPSON'S REPORT ON THE WATER SUPPLY OF CARLISLE.

“The city of Carlisle, although nearly surrounded by the rivers Eden, Caldew, and Petteril, lies at an elevation above them which renders it necessary either to raise the water to a proper level by steam power, or to bring it from higher points of these rivers at considerable distances from the city. Mr. Stephenson, the engineer, estimated the expense of supplying the town from a high level of the river Petteril, near Wreay, at a sum of 30,800*l.*

“Various springs in the neighbourhood were suggested as sites of supply: particularly those at Blackwell, and the Cowran cut on the Newcastle and Carlisle Railway; these were found inadequate in quantity or of insufficient elevation. Mr. Anderson, the engineer, who examined the Cowran spring, reported that it would yield only 150,000 gallons in 24 hours,—a quantity which he considered wholly inadequate

* Several modifications are suggested in another part of this Report. Greater pressure would have rendered the works more efficient for some purposes, and a softer water might probably have been obtained at an elevation sufficient to dispense with pumping. Mr. Simpson seems, however, to have examined this side of the question before deciding on the present scheme; as, see his Remarks.

to the supply of a town of 25,000 inhabitants; and the Blackwell spring was ascertained to be on a level only with the flagging in English-street, the quantity of water being considered by Mr. Stephenson as too uncertain to be depended on.

“The unanimous opinion of the engineers to whom the subject has been referred for consideration is, that the supply of water must be obtained from one of the rivers, either by pumping contiguous to the city, or by gravitation; forming a store reservoir at such a distance as to obtain sufficient elevation.

“The latter plan, where circumstances are favourable to its adoption, is undoubtedly the best, by superseding the expense of pumping. But, as applied in the present instance, it would be found unavailable, the supply of water being insufficient, and the requisite outlay too great to be incurred.

“Mr. James Simpson, engineer of the Lambeth and Chelsea Water-Works (London), suggested and carried out the present plan, by which the town is supplied with water.

“Mr. Simpson has erected a steam-engine in the Stoney Holme, at a point near the junction of the Petteril with the Eden. The water is taken from the latter river, and, after filtering, is conveyed across the land of the Duke of Devonshire, along Union-street and the London-road to Gallow-hill,* into a large reservoir near St. Cuthbert’s workhouse.

“This reservoir is of sufficient capacity to contain about 10 days’ supply; and the water will flow to all the streets and places in the borough through pipes varying in size according to the probable wants of each district.

“The height of the reservoir is 40 feet above the level of the flagging at the gaol, being the highest ground in Carlisle.

“The principal buildings and manufactories in the town and neighbourhood can thus at all times have the command of a large body of water in cases of fire, which, as the mains will be constantly charged, can be obtained at a moment’s notice from fire-plugs fixed at available distances; posts are placed at convenient parts of the town to provide supplies for cleansing and watering the streets, and other purposes.

“COMPARATIVE LEVELS OF THE CITY.

“Datum for the levels—the pavement opposite the gaol, in English-street: being the highest part of the town.

		Above Datum.		Below Datum	
		Ft.	In.	Ft.	In.
Gallow Hill	.	43	0	0	0
Highest ground at Stanwix	.	23	0	0	0
Ditto	near the Raffles	14	10	0	0
Ditto	at Murrell Hill	10	5	0	0
Ditto	in Castle Yard	4	7	0	0
Ditto	at Canal pumping engine	3	2	0	0
Entrance gate to Messrs. Dixon’s mill	.	0	0	33	0
The Eden at the mouth of the Petteril,					
surface of water	.	0	0	48	5

* Formerly *Gallows Hill*, as being the site of execution for criminals and rebels. Sir Walter Scott makes it the scene where the gallant *Fergus Mac-Ivor*, the last *Vich Ian Vohr*, ended his life.

"ANALYSIS OF WATER.—The composition of the imperial gallon was as follows :—

A.—FIXED CONSTITUENTS.

a.—Appreciable by the Balance.

	Grains.	Grains.
Sulphate of lime	1·68	
Chloride of calcium	·61	
Chloride of magnesium	·86	
Silica	·37	
Alumina	·29	
Carbonate of lime	4·51	
	—	8·32

b.—Not Appreciable by the Balance.

Chloride of sodium.
Carbonate of iron.
Carbonate of magnesia.
Organic matter, containing some crenic and apocrenic acids.

B. VOLATILE CONSTITUENTS.

Oxygen	·22	
Azote	·77	
Carbonic acid	3·17	
	—	4·16

Total fixed and volatile 12·48

(Signed) ——— RICHARDSON,
Analytical Chemist, Newcastle.

"Original Estimate for the Works for conveying Water from the River Eden to the Reservoir on Gallow Hill for supplying the City of Carlisle and its Environs.

Reservoir and works on Gallow Hill	£1,200	0	0
Filter near the engine-house	200	0	0
Supply and main, pipes, cocks, watering-posts, fire-plugs and boxes, &c.	7,987	0	0
Lead branch pipes, and brass work for the same	1,500	0	0
Engine and pumps complete	1,450	0	0
Engine-house, shaft, and cottage	800	0	0
Land for reservoir, engine-house, &c.	500	0	0
	£13,637	0	0
Contingencies, incidental expenses, &c., 10 per cent.	1,363	0	0
	£15,000	0	0

"This estimate includes the cost of carrying the service-pipes—on the principle adopted by the Gas Company—to the outside wall of each

* "Mr. Steel stated that the original estimate was 15,000*l.*, but the actual cost, by reason of our extending the pipes much beyond what was originally contemplated, will be about 22,000*l.* The population is about 27,000.

house requiring to be supplied, leaving to the occupier only the cost of furnishing the interior pipeage to any suitable extent.

“ The sum required it is proposed to raise in 1,500 shares of 10*l.* each.

“ ESTIMATED INCOME.

TABLE showing the NUMBER of HOUSES, the YEARLY RENTAL, the proposed WATER RATE, and the REVENUE derivable therefrom.

Number of Houses.	Yearly Rental.									Water Rate.						
		£.	s.	d.	£.	s.	d.	£.	s.	d.	1 <i>d.</i> per week, or	s.	d.	£.	s.	d.
2,132	below	3	0	0							4	4		461	18	8
525	at	3	0	0							4	6		118	2	6
317		4	0	0							5	0		79	5	0
185		5	0	0							5	0		50	17	6
131		6	0	0							6	0		39	6	0
97		7	0	0							7	0		33	19	0
102		8	0	0							8	0		40	16	0
91		9	0	0							9	0		40	19	0
73		10	0	0							10	0		36	10	0
37		11	0	0							11	0		20	7	0
134		12	0	0	&	13	0	0			12	0		80	8	0
77		14	0	0	&	15	0	0			13	0		50	1	0
61		16	0	0							14	0		42	14	0
21		17	0	0							15	0		15	15	0
27		18	0	0							16	0		21	12	0
20		19	0	0							17	0		17	0	0
51		20	0	0							18	0		45	18	0
43		21	0	0	&	22	0	0			19	0		40	17	0
59		23	0	0	&	24	0	0			20	0		59	0	0
23		25	0	0	&	26	0	0			21	0		24	3	0
32		27	0	0	&	28	0	0			22	0		35	4	0
9		29	0	0							23	0		10	7	0
6		30	0	0							24	0		7	4	0
5		31	0	0							25	0		6	5	0
25		32	0	0							26	0		32	10	0
14		33	0	0	&	34	0	0			27	0		18	18	0
24		35	0	0	&	36	0	0			28	0		33	12	0
14		37	0	0	&	38	0	0			29	0		20	6	0
23		39	0	0	&	40	0	0			30	0		34	10	0
10		41	0	0	&	42	0	0	&	43	0	0		15	10	0
9		44	0	0	&	45	0	0			32	0		14	8	0
1		47	0	0							33	0		1	13	0
22		48	0	0	&	49	0	0			34	0		37	8	0
3		50	0	0							35	0		5	5	0
6		51	0	0	&	52	0	0			36	0		10	16	0
7		53	0	0	&	54	0	0			38	0		13	6	0
14		55	0	0	&	56	0	0	&	57	0	0		28	0	0
1		59	0	0							41	0		2	1	0
2		60	0	0							42	0		4	4	0
3		61	0	0	&	62	0	0			43	0		6	9	0
4		63	0	0	&	64	0	0	&	65	0	0		9	0	0
6		66	0	0	&	67	0	0	&	68	0	0		14	2	0
2		69	0	0	&	70	0	0			48	0		4	16	0
3		72	0	0	&	74	0	0			50	0		7	10	0
7		77	0	0	&	80	0	0			52	0		18	4	0
4		81	0	0	&	82	0	0	&	85	0	0		100	16	0
2		88	0	0	&	90	0	0			56	0		5	12	0
6		96	0	0	&	100	0	0			60	0		18	0	0
11		Above 100		0	0						80	0		44	0	0
4,481		. . .										. .		1,789	4	8

	£.	s.	d.
From private houses a revenue of .	1,789	4	8
Extra charges on inns, public houses, and institutions . . .	80	0	0
Water-closets, 150 at 10s. . .	75	0	0
Private baths and factories . .	100	0	0
Street-watering	20	0	0

£2,064 4 8

Deduct one-eighth of the total number of houses which would probably remain unsupplied, 560 at 11s. . £308 0 0

Deduct for outlying houses beyond the reach of services 26 4 8

334 4 8

Gross revenue . £1,730 0 0

“ Deduct the annual expense of conducting and carrying on the works as under :—

“ ESTIMATED ANNUAL EXPENSE of conducting and carrying on the Works.

	£.	s.	d.	Actual Cost of Working.	£.	s.	d.
Management	80	0	0		60	0	0
Inspectors and turncocks	120	0	0		30	0	0
Working engine	100	0	0		120	0	0
Maintenance of works . .	30	0	0		..	..	..
Taxes and compensation.	30	0	0		..	..	..
Sundries	10	0	0		..	..	..
	£370	0	0		*£210	0	0

Contingencies — office rent, printing, &c.—
10 per cent.

37 0 0

£407 0 0

	£.	s.	d.
Gross revenue	1,730	0	0
Deduct management as above . .	407	0	0

Net revenue . £1,323 0 0

“ ESTIMATED SUPPLY.—Take the population at 25,000 (23,000 was the precise number according to the census of 1841), and the quantity required, at the rate of 10 gallons each, will be 250,000 gallons per

* “ The Secretary, Mr. Routledge, estimates that 300*l.* annually will cover all working expenses and contingencies.

day for domestic purposes. In addition to this quantity there will be provided :—

45,000	gallons per day for watering streets.
20,000	ditto factories, engines, &c.
1,000	ditto public offices.

Making a total of 300,000 gallons per day.

“ DESCRIPTION OF ENGINE.—A steam-engine of 30-horse power will raise to the requisite height 300,000 gallons in eight hours. Such an engine will therefore be capable of trebling the quantity estimated to be necessary for ordinary supply, in any case of emergency, or to meet a larger demand at a future period.*

“ A reservoir, one acre area and of a depth of 10 feet, will contain 2,800,000 gallons of water ; a quantity equal to about 10 days’ supply at the assumed rate ; and being kept full will leave ample time for the repairs of the engine, and the necessary reinstatement of the pumps.”

The engine has been erected, the reservoir formed, and both are now in use.

The following table details the various items of expense incurred to raise each thousand gallons 96 feet high. It shows that, as the demand has increased, the cost has diminished, and consequently it is for the advantage of the Company, as for the inhabitants at large, that the supply should be general.

In the table of rates, the separate charge for water-closets will require to be modified for cottages ; and this may be done if the works pass into the hands of the local Board. It may, however, be included in one moderate rent-charge by the Company, when pan-closets have superseded privies and cesspools, as they must do, if ever the courts and lanes of the city are to become healthy to such an extent as they ought to be made.

* “ The engine works six strokes per minute, and lifts 70 gallons of water each stroke. The engine may be worked up to eight strokes per minute.

TABLE of ACTUAL WORKING EXPENSES.

Week ending	Number of Gallons raised 96 Feet high.	Net Coals used.	Cost of Coals consumed.	Net Coke used.	Cost of Coke used.	Oil and Material used.	Wages paid.	Total Cost.	Cost of Lifting each 1000 Gallons.	REMARKS.
1848.	Gallons.	Cwts.	£. s. d.	Cwts.	s. d.	s. d.	£. s. d.	£. s. d.	d.	
July 1	996,120	56	0 18 10	4	2 4	2 6	1 7 0	2 10 8	.6103	
" 8	935,700	54	0 18 4	10	5 10	2 6	1 7 0	2 13 8	.6871	
" 15	810,840	48	0 15 5	6	3 6	2 6	1 7 0	2 8 5	.7165	
" 22	1,044,640	54	0 16 9	10	5 10	2 6	1 7 0	2 12 1	.5693	
	3,787,300	..	..	..	..	..	..	10 4 10	.649	Month's average rate per 1,000 gallons.
1849.										
March 3	1,172,400	60	0 16 6	..	..	3 0	1 7 0	2 6 6	.4759	
" 10	856,800	50	0 13 9	..	..	3 0	1 7 0	2 3 9	.6127	
" 17	824,340	45	0 12 1½	..	..	3 0	1 7 0	2 2 1½	.6126	
" 24	1,057,080	60	0 16 6	..	..	3 0	1 7 0	2 6 6	.5279	
	3,910,620							8 18 10	.5487	Month's average rate per 1,000 gallons.
Oct. 6	1,411,500	70	0 19 3	..	..	3 0	1 7 0	2 9 3	.4187	
" 13	1,497,420	65	0 17 10½	..	..	3 0	1 7 0	2 7 10½	.3806	
" 20	1,362,300	70	0 19 3	..	..	3 0	1 7 0	2 9 3	.4338	
" 27	1,347,540	75	1 0 7¼	..	..	3 0	1 7 0	2 10 7¼	.4504	
	5,618,760	..	..	..	..	..	..	9 16 11	.42	Month's rate per 1,000 gallons.

TABLE OF CHARGES.

“ Carlisle Joint Stock Water-works.”—The Directors of the Carlisle Joint Stock Water-works Company are prepared to receive applications for supplying water to the inhabitants of Carlisle; and having fixed the rates at a very low scale, trust that early orders will be given to enable them to make all necessary arrangements. The following table of rates has been fixed upon:—

SCALE of PRICES for DOMESTIC PURPOSES

Houses of the Annual Rent of	Per Annum.	Houses of the Annual Rent of	Per Annum.	Houses of the Annual Rent of	Per Annum.
£.	£. s. d.	£.	£. s. d.	£.	£. s. d.
5 and under	0 4 0	37 and under	1 2 6	69 and under	1 18 6
6 „	0 5 0	38 „	1 3 0	70 „	1 19 0
7 „	0 6 0	39 „	1 3 6	71 „	1 19 6
8 „	0 7 0	40 „	1 4 0	72 „	2 0 0
9 „	0 8 0	41 „	1 4 6	73 „	2 0 6
10 „	0 9 0	42 „	1 5 0	74 „	2 1 0
11 „	0 9 6	43 „	1 5 6	75 „	2 1 6
12 „	0 10 0	44 „	1 6 0	76 „	2 2 0
13 „	0 10 6	45 „	1 6 6	77 „	2 2 6
14 „	0 11 0	46 „	1 7 0	78 „	2 3 0
15 „	0 11 6	47 „	1 7 6	79 „	2 3 6
16 „	0 12 0	48 „	1 8 0	80 „	2 4 0
17 „	0 12 6	49 „	1 8 6	81 „	2 4 6
18 „	0 13 0	50 „	1 9 0	82 „	2 5 0
19 „	0 13 6	51 „	1 9 6	83 „	2 5 6
20 „	0 14 0	52 „	1 10 0	84 „	2 6 0
21 „	0 14 6	53 „	1 10 6	85 „	2 6 6
22 „	0 15 0	54 „	1 11 0	86 „	2 7 0
23 „	0 15 6	55 „	1 11 6	87 „	2 7 6
24 „	0 16 0	56 „	1 12 0	88 „	2 8 0
25 „	0 16 6	57 „	1 12 6	89 „	2 8 6
26 „	0 17 0	58 „	1 13 0	90 „	2 9 0
27 „	0 17 6	59 „	1 13 6	91 „	2 9 6
28 „	0 18 0	60 „	1 14 0	92 „	2 10 0
29 „	0 18 6	61 „	1 14 6	93 „	2 10 6
30 „	0 19 0	62 „	1 15 0	94 „	2 11 0
31 „	0 19 6	63 „	1 15 6	95 „	2 11 6
32 „	1 0 0	64 „	1 16 0	96 „	2 12 0
33 „	1 0 6	65 „	1 16 6	97 „	2 12 6
34 „	1 1 0	66 „	1 17 0	98 „	2 13 0
35 „	1 1 6	67 „	1 17 6	99 „	2 13 6
36 „	1 2 0	68 „	1 18 0	100 „	2 14 0

“ Each water-closet will be charged 10s. per annum extra. Baths by special agreement.

“ Steam-engines will be charged at a fixed rate per horse power; or the owner, by providing his own tank, will be supplied at the rates of 10d. per 1,000 gallons.

“ Inns, stables, and workshops, &c., will be supplied by special agreement according to circumstances.

“ All rates, except those chargeable by quantity, will be payable in advance. For all houses of less rent than 10*l.*, the rate to be chargeable to the landlord.

“ The Company will convey the service-pipes to the outer wall of each house; the interior fittings to be at the cost of the consumer.

“ The supply of water will be constant ; and no tanks or cisterns will be required except by those who desire to purchase by quantity.

“ By order of the Directors,

“ *Office, Town Hall,
June 10, 1847.*”

“ E. ROUTLEDGE, *Secretary.*

An ACCOUNT of the Number and Description of Properties supplied with Water by the CARLISLE WATER COMPANY, at the time of the Inquiry.

500 private dwellings at 10*l.* and above.
2,717 ,, under 10*l.* value.
85 inns.
106 shops.
23 stables.
49 water-closets in private houses.
9 public buildings.
20 baths in private houses.

I have embodied the following abstract from the published report of proceedings, &c. at the annual meeting, as containing information and remarks of more than local interest, such as those with respect to the prevention of cholera and the use of soft water for engine purposes.

“ *Abstract of Annual General Meeting, detailing the condition and future prospect of the Company.*—The second annual general meeting of this Company was held at the Town Hall, on Tuesday last, and was attended by a considerable number of shareholders. Amongst those present were the mayor (Joseph Rome, Esq.) ; John Dixon, Esq., of Knells ; John Fawcett, Esq., of Petteril Bank ; George Dixon, Esq. ; the Rev. E. Brown ; the Rev. W. Vaughan, Castlecarock ; the Rev. J. Twentyman ; Mr. W. R. Martindale ; Mr. Relph ; Mr. J. Irving ; Mr. T. Nelson ; Mr. D. Nelson ; Mr. J. Fleming, &c. &c.

“ Mr. Steel, Chairman of the Company, said he thought the shareholders might fairly congratulate themselves on the progress which the Company had made ; for, although it had had but a short existence, its prospects of success had improved steadily and almost daily, and it still held out prospects of increased advantages of considerable importance. He believed he might say, that when the scheme was first entered upon, shares were taken, by the bulk of the proprietors, not so much for the purpose of making great profits, as with the view of conferring a benefit upon the town. So far their object had been fully realised, for the town had undoubtedly been greatly benefited and improved by the water. In the year 1848, when the works were first put into operation, the cholera made its appearance in Carlisle, although it did not spread to any extent ; but he believed he was justified in saying that in no part of the town then supplied by the Company’s water, was a single cholera patient found. And during the last year when that dreadful scourge desolated so many parts of the country, when the disease prevailed to so fearful an extent all round—when it was raging at Maryport, Workington, Newcastle, Dumfries, and indeed in most places around Carlisle, this city happily escaped from the pestilence, scarcely a single case having occurred.

For that particular circumstance he believed they were, under Providence, mainly indebted to a constant and plentiful supply of good water. In this view he was, to a certain extent, borne out by a recent Report of the Registrar-General, of deaths in the metropolis, in which he had shown that in those parts of the City of London which were well supplied with pure water, the cholera made little progress, whilst in those places not so supplied, its ravages were most frightful. These were striking facts, and would no doubt tend to increase the demand for the Company's water. However, besides conferring this benefit on the town, the undertaking had been so far prosperous as to enable the Directors to make some return upon the capital embarked.

"John Dixon, Esq., of Knells, said he could not but congratulate the shareholders on the very prosperous state of their affairs. From the commencement of the undertaking he had felt a deep interest in its welfare, feeling that in the establishment of water-works were involved some of the best interests of the community. It would have been folly to have attempted any great sanitary improvements, as regarded sewers and many other things, until a full and adequate supply of water had been secured. In that opinion he had been fortified by the reports of the most eminent men engaged in the inquiries into the health of towns. It was remarkable, but perfectly demonstrable, that wherever the supply of good water was abundant, there the public health was in the most satisfactory state. It was, therefore, a subject for congratulation, that in spending their money they had conferred a great benefit upon the public at large; and it was further gratifying to know, that in doing this they had not injured themselves; for it was quite clear, from the report of the Directors, that the concern was in a very prosperous condition. The only question of any difficulty was, as between landlord and tenant, which party should bear the expense of taking in the water; but this, he trusted, would easily be arranged, where differences had occurred, and that no part of the town would remain without a full supply of water.

"Mr. J. D. Carr wished to make one or two observations. In the statement of accounts he observed there was an item of 167*l.* 5*s.* put down as income from locomotive and other engines. From this, it appeared to him that the value of the water was not so well known as it ought to be, especially in the working of steam-engines, or it would be more generally used for that purpose. He had used the water in his own boilers for about a year and a half; and from his experience he could say, that instead of having to incur the expense of cleaning them out once in five or six weeks, as was the case when he used other water, he now, with the use of the Company's water, only cleaned them out once in six or eight months; and even that he believed to be unnecessary, as he was satisfied they might be used for 12 months; but as they had the flues to clean out he availed himself of that opportunity of cleaning the boilers. That fact ought to be more extensively known than it appeared to be; for it certainly placed Carlisle in a position scarcely to be surpassed by any town in the kingdom, for manufacturing purposes. He trusted that those who possessed engines would turn their attention to this subject, and consider how far it would be to their own advantage to make use of the water supplied by the Water-works Company. For his own part he should say that were

he to make the calculation, he should find that by the use of that water he had effected a saving of 100*l.* a-year in the working expenses of his engines."

The following copy of the reports and balance-sheet, on the 31st October of each year, exhibits the progress of the Company in the last twelve months:—

TABLE of RENTS and AMOUNTS RECEIVED for the Years 1848 and 1849.

	1848		1849	
	Number of Renters.	Amount of Rents.	Number of Renters.	Amount of Rents.
		£. s. d.		£. s. d.
From houses under 10 <i>l.</i> a-year } rent	1,467	306 8 0	2619	536 19 0
From houses at and above 10 <i>l.</i> .	330	148 0 0	467	347 19 0
,, inns	70	104 18 6	79	112 0 6
,, shops	74	38 18 0	103	47 14 0
,, stables	15	10 3 0	22	13 17 0
,, breweries	5	27 10 0	6	28 10 0
,, water-closets	22	10 0 0	49	22 10 0
,, baths	11	3 10 0	20	5 13 6
,, public buildings	8	53 17 0	9	73 17 0
From locomotive and other engines . . . . .	..	148 5 0	..	167 5 0
From streets . . . . .	..	29 0 0	..	32 0 0
,, sundries . . . . .	..	2 10 0	..	4 12 0
	..	983 3 6	..	1,392 17 0

" Applicants for supplies of water steadily increase, and at the present moment (January 1, 1850), the annual rentals amount to 1,430*l.*

" At the date of the last report the amount due upon shares was 759*l.* The whole of this has now been paid up, together with interest upon the deferred payments, the entire share capital being thus advanced without the slightest loss, and without litigation—circumstances somewhat rare, it is believed, in the history of joint stock companies.

" In their last report the Directors were unable to state precisely the entire cost of the works, as the arbitrators appointed for the purpose had not then fixed the price to be paid for the land at Gallow Hill, whereon the reservoir has been constructed, nor for that in the Stoney Holme, the site of the engine-house and filter beds, nor had they then ascertained the amount of legal expenses for registering the Company; but they expressed a belief that a sum of 22,000*l.* would meet all the liabilities of the Company. Since that period the arbitrators have fixed the price of the land for the reservoir at 913*l.* 6*s.* 3*d.*, and of that for the engine-house, &c. at 114*l.* 12*s.* 6*d.* The legal expenses (including the cost of arbitration) amount to 372*l.* 6*s.* 7*d.* These items make the total outlay 21,963*l.* 5*s.* 7*d.* There are still a few items unsettled by the engineer, but these, the Directors do not expect, will much exceed the sum named.

" There is also a farther sum of 183*l.* due for pipes; but as nearly the whole of these are on hand, the real expenditure may be taken as above stated. Payment for the land has not been made—the proprietor

of that at Gallow Hill being willing to allow it to remain as debt, for which interest is to be paid; and the site of the engine-house will be paid for as soon as the deeds of conveyance are completed—interest for the amount being payable in the meantime.

CAPITAL ACCOUNT.

Receipts and Expenditure from the 1st November, 1848, to 31st October, 1849, inclusive.

<i>Dr.</i>	<i>Receipts.</i>			
To cash, balance from last year	£330	4	4	
To cash, calls on shares	795	0	0	
To cash, deposits from G. G. Mounsey, Esq.	75	5	0	
To cash, pipes and materials sold	129	1	7	
To cash, interest from calls over- due	£78	0	11	
To cash, interest on bank account	10	12	5	
		88	13	4
To balance due revenue		887	15	7
				<u>£ 2,302 19 10</u>

<i>Cr.</i>	<i>Expenditure.</i>			
By cash paid for engine	£111	3	6	
By cash paid for engine-house and filter	421	1	1	
By cash paid for reservoir and laying pipes	418	7	2	
By cash paid for iron pipes and castings	501	10	7	
By cash paid for plans	2	17	6	
By cash paid for incidentals	3	14	7	
		1,458	14	5
By cash paid for plumber's work		391	2	1
By cash paid for salaries and wages		11	2	5
By cash paid for legal charges (including arbitration)		341	2	1
By cash paid for interest		100	18	10
				<u>£ 2,302 19 10</u>

Receipts and Expenditure from the formation of the Company till 31st October, 1849.

<i>Dr.</i>	<i>Receipts.</i>			
To cash from shares	£15,000	0	0	
To cash borrowed on bonds	5,000	0	0	
To cash, deposits on scrip	72	5	0	
To cash, interest	£218	15	7	
Less interest paid	215	10	7	
		3	5	0
To balance		887	15	7
				<u>£ 20,963 5 7</u>

<i>Cr.</i>	<i>Expenditure.</i>	£.	s.	d.
By cash paid for engine and pumps . . .		2,129	11	8
By cash paid for engine-house	£3,171 1 1			
Less received from G. H. Head, Esq.	912 7 8			
		2,258	13	5
By cash paid for reservoir and laying pipes		4,113	1	6
By cash paid for iron pipes and castings	10,366 19 5			
Less pipes, &c. sold	280 18 7			
		10,086	0	10
By cash paid engineer		800	0	0
By cash for plans and tracings	26 17 6			
Less tracings sold	1 5 0			
		25	12	6
By cash paid for plumber's work		679	17	10
By cash paid for salaries and wages		105	1	9
By cash paid for rents		38	10	0
By cash paid for taxes		1	19	1
By cash paid for stationery and printing		112	18	11
By cash paid for legal expenses		372	6	7
By cash paid for roads		205	3	9
By cash paid for incidentals		34	7	9
		£ 20,963	5	7

MEM.—In addition to the above expenditure, the following sums are owing by the Company, viz.:—For land at Gallow Hill, 913*l.* 6*s.* 3*d.*; for land at Stoney Holme, 114*l.* 12*s.* 6*d.*; and for iron pipes (principally unused), 183*l.*

REVENUE ACCOUNT.

Receipts and Expenditure from the 1st November, 1848, to the 31st October, 1849.

<i>Dr.</i>	<i>Receipts.</i>	£.	s.	d.
To balance from last year's account		260	19	6
To cash from water rents		1,214	12	4
To cash, certificates of transfers		7	19	0
		£ 1,483	10	10
<i>Cr.</i>	<i>Expenditure.</i>	£.	s.	d.
By cash for salaries and wages	172 4 3			
By cash for coals and material for engine	48 0 6			

	£.	s.	d.	£.	s.	d.
By cash for rents . . .	21	3	3			
By cash for rates and taxes .	21	12	0			
By cash for stationery and printing	14	3	6			
By cash for tradesmen's accounts	41	1	1			
By cash for auditors . . .	4	4	0			
By cash for petty cash . . .	5	7	11			
				327	16	6
By cash for interest on bonds, &c.				225	17	1
By cash for balance				929	17	3
				<u>£ 1,483</u>	<u>10</u>	<u>10</u>

LIABILITIES AND ASSETS on the 31st October, 1849.

Liabilities.

	£.	s.	d.
Interest on bonds	167	18	3
Tradesmen's accounts	24	9	6
Balance	820	4	10
	<u>£ 1,012</u>	<u>12</u>	<u>7</u>

Assets.

Balance brought down	929	17	3
Accounts not collected	82	15	4
	<u>£ 1,012</u>	<u>12</u>	<u>7</u>

(Signed) { WILLIAM RICHARDSON, } Directors.
 { GEORGE RELPH, }
 { JOSEPH FORSTER, } Auditors.
 { JOSEPH HANNAH, }

AUDITORS' REPORT.

" Having examined the accounts of the Carlisle Water-works Company for the year ending 31st October, 1849, and having carefully compared the various entries with the orders, vouchers, and receipts, and the agreements for supplying water with the amounts collected, we have much pleasure in stating that we found the said accounts in every respect satisfactory.

" The balance-sheet furnished by the Directors is so ample in detail, and so clear in arrangement, that we deem it superfluous, on our part, to offer any remark upon it.

" We would, therefore, only further state, that every facility was afforded during the audit, to enable us to make a full investigation of the accounts.

" December 24, 1849.

(Signed) { " JOSEPH HANNAH.
 { " JOSEPH FORSTER."

RECOMMENDATIONS, REMARKS, AND SUGGESTIONS AS TO THE WATERWORKS.—For several reasons, I beg to recommend to the citizens of Carlisle that the Corporation may be empowered to purchase the present water-works, but principally that they (the works) may be managed solely for the public benefit. Water may be used in Carlisle most beneficially for many sanitary purposes other than house supply, and it will be of the highest possible importance that it shall be so used without detailed charge, as also without stint.

1. For watering public roads and streets, and cleansing pavements, channels, and footwalks. Every portion of the city may be washed and cleansed by the hose in winter, and be washed and cooled daily in summer.

2. The water may be used to wash all lanes, courts, and alleys, as also to purify the air, and for assisting in the ventilation of all such confined places, by throwing up, from a jet, an artificial shower during hot or sickly periods of the year. Such an operation will aid more in producing thorough ventilation, and purifying the atmosphere, than any other single means.

3. The Corporation, as the local board, may also provide free fountains and watering troughs for horses, cattle, and dogs, in various parts of the city and its suburbs. The advantages of such provision are so apparent and so great that they need not be detailed.

4. Public baths and washhouses may be provided throughout the city at the least cost to the inhabitants generally.

5. Expense in management will be reduced, as one engineer may superintend all the works belonging to the citizens, such as sewers and drains, water supply, gas, pavements, cleansing, &c. The same clerks and collectors may also perform the duties required in the consolidated works.

The present waterworks may, in several respects, be materially improved. The storage reservoir ought to be covered entirely over, where the water will be retained cool and free from impurities, animal and vegetable. Duplicate filters, more perfect in their action than the present filter in the river, may be constructed to purify the water passed from the present storage reservoir into a service reservoir which may be made. These filters may be of such construction as to be comparatively self-acting, and which, with the service reservoir, shall at all times purify and cool the water perfectly before it is passed into the mains.

All stand-pipes, or other forms of external house-supply should be abolished, and each house, tenement, and room oc-

cupied as a dwelling, should have its appropriate and independent supply, to secure the following advantages:—

1. Freshness, purity, and coolness in the water; and, as it will be drawn at all times from the mains, the poorest person need not retain any portion of his supply in open vessels, exposed to the vitiating gases of a dwelling-house.

2. The supply-pipes, if taken into the houses and rooms of the poor, will be protected from much injury now caused by children; as also from injury by indiscriminate use, and they will also be better secured from damage by frost. The slightest leak will be repaired at once, and every tenant will act as a police over the safety and proper usage of his or her individual supply apparatus.

3. Labour will be diminished, and one great cause of irritation and gossip amongst the poor will be removed. There will be no ground for angry recrimination, as to which person, or whose child injured the stand-pipe, neither will there be any assemblies, such as at present, waiting for water. The house supply will also entirely do away with another existing abuse, namely, the degrading subterfuge of any one person holding back from a just payment, however small, to beg water from his or her neighbours, or to steal it from the exposed, and therefore, so far, common stand-pipe.

Paupers, and recipients of corporate charity, may have a supply furnished gratis; there will also be the public fountains for those who perseveringly refuse to pay the required rent; so that even the degraded and obstinate shall not be entirely cut off from any form of supply. But this is rather a difficulty in anticipation than such as ever will take place in reality. The experience in those towns and districts where house supplies have been given, is, that the poorest person will not take a cottage, or room, unless there is a supply of water laid on. This is where the rent-charge, as in Carlisle, does not exceed 1s. or 1s. 3d. a quarter. The first cost of such house, or room supply apparatus complete, including a screw-down tap, is only 5s. This is the price at present charged in Wolverhampton by the Waterworks Company; but with the works in the possession of the public authorities in Carlisle this outlay may be turned into a rent-charge, which shall include maintenance of the apparatus.

Such is a brief sketch of the advantages which may be accomplished by the works passing into the possession of the Corporation. No doubt some of these improvements may be effected by the present company, but not with the same degree of interest and utility, as by a public body. A company may make the works of supply and distribution complete in every form, equally with any public body; but they never can have

the same motives and interest to urge a public and general use of water for purely public purposes (surface washing, and as a means of ventilation, in crowded districts, for instance) neither can they possibly have the same means at their disposal to accomplish this use. The arguments hitherto brought against public bodies possessing waterworks and gas-works, will no longer apply. Public attention has been fully awakened to the great and urgent necessity there is for universal fulness and efficiency of the application and use of water in towns and cities, as also for proper management and rigid economy connected with the works in their construction, working, and distribution.

Gas light, in its public application and use, is intimately connected with police. Robbery, immorality, and mischief are diminished, if not entirely prevented by a full and proper system of lighting. The cost of one extra policeman will pay for many gas lamps. So, also, a full water supply is bound up indivisibly with sanitary regulations generally, other than house service or for manufacturing purposes. General cleansing, purifying, and ventilation, may be aided by the use of water, under pressure, and be a means of preserving health to the poor, thereby reducing the poor's rates; the benefits will be reaped by all classes. As detailed in the remarks on ventilation, districts unduly crowded cannot always be taken down; such a proceeding would in many instances not be improvement, but would amount to utter destruction or confiscation of property, and therefore neither can or will be consented to. But sanitary works, in sewers and drains, proper pavements, a substitution of water-closets for open privies and cesspools, the removal at short intervals of all solid refuse, &c., proper means of ventilation at or near the ceiling of every room, with the use and application of water by the hose and jet for cooling, purifying, and cleansing purposes, will render the most confined lane, yard, or court comparatively healthy, in so far as a fresh and pure atmosphere is concerned. Light and sunshine can only be obtained by the removal of solid obstructions; and many judicious improvements may be made with comparative economy to aid in obtaining both. Blank walls may be perforated, larger windows may be opened, and top lights may be enlarged and made available.

In seeking after improvement each locality and place will require to be considered carefully, and should then be dealt with on its peculiar merits. A yard, lane, or court may be unhealthy from a combination of causes, to remove any one of which singly would accomplish little good; nay, some forms of improvement, injudiciously applied, may be a positive harm, and a source of increased nuisance. For instance, a water supply without drains and surface pavement, will generate

damp, and its attendant evils and misery. Drains improperly graduated, or imperfectly constructed, may be so many retorts for the generation of foul and deadly gases; and the most perfect drains and water supply will not avail if open privies and cesspools are retained. These, however, may be added, and house and room ventilation remain as at present most imperfect. This may be insisted on and be carried out, and yet surface cleansing, at short intervals, be neglected.

In advocating that all these works shall be under one local Board, efficiency and economy are advocated also; private individuals, however wealthy, or sections of one community, combined in a city or town, however willing, as a section, cannot accomplish separately that which may be done with signal advantages by a public body having full control over the whole works, and the entire area of the district. The managers and servants of such an establishment will be elected by the rate-payers. The accounts must be published; these can be contrasted with similar accounts from other and independent districts. They will be published in the local newspapers, so that one district or establishment will be a check upon all others; and, as in the management of the Cornish pumping engines, where full accounts of the performances of each are published, all must come up to the best standard. Emulation will produce efficiency, as also economy.

LIGHTING.—The gas-works have recently been transferred to the corporation, as the abstracts given with this report will explain.

Carlisle is lighted under the authority of an Act passed in the 59 Geo. III.

The corporation are now the Commissioners.

The number of public lamps is 488, viz.:—

143 single jets,	$1\frac{1}{2}$ cube feet per hour
201 flat-flames,	$3\frac{1}{2}$ „
144 bat-wings,	$5\frac{1}{2}$ „

The distance at which the lamps are placed, varies according to circumstances, from 40 to 60 yards. Some few at the outskirts are placed as much as 80 yards apart.

They are lighted 330 nights in the year, from sunset till sunrise.

The gas company erect and fit up all the lamps; they also light, extinguish, and keep them in repair.

The charge is for single jets 31s.; flat-flames 42s., and bat-wings 53s. for the season.

A rate of 6*d.* in the pound on the poor-rate valuation, produces about 970*l.*, and is required to pay for the lighting.

All courts, lanes, &c. being thoroughfares, or having five dwellings with distinct and separate doors are lighted.

The rate is levied on all dwelling-houses and buildings,

manufactories, yards, &c. within the district lighted; land and market gardens are excepted. The amount of rental on which the rate is levied is about 40,000*l*.

The gas is charged to private consumers at 5*s*. per 1,000 feet. There are no exceptions.

A correct ground plan of the town is kept, on which the situation of all the lights is shown.

ABSTRACT OF NOTICE TO TRANSFER GAS WORKS TO CORPORATION.

The following is the notice of application made to Parliament to seek powers to transfer the works to the Corporation. This has recently been accomplished, and, henceforward, the works may be managed for the benefit of the citizens. To light all the suburbs, streets, lanes, and other public places will be of great advantage, as a lamp may prevent robbery and crime, and suppress immorality:—

“THE CARLISLE GAS LIGHT AND COKE COMPANY.

“(Authorizing a transfer of the Company’s works and powers to the Corporation; enabling the Corporation to light the city and its environs, and to raise money, and to execute other powers; repeal or alteration of Acts for lighting the city and its environs, and other purposes.)

“NOTICE is hereby given, that application is intended to be made to Parliament in the ensuing session for leave to bring in a Bill to authorize the mayor, aldermen, and citizens of the city of Carlisle to purchase or acquire, or to accept a transfer of, all the houses, lands, plant, works, mains, pipes, stock, debts, gas-rents, and other moneys, shares, properties, and effects, and powers, rights, and privileges of ‘The Carlisle Gas Light and Coke Company,’ incorporated by an Act passed in the 59th year of the reign of His Majesty King George III., entitled ‘An Act for lighting the city of Carlisle, and the suburbs thereof with gas;’ and also to enable the said Company to contract for the sale or transfer of their said undertaking and powers, rights, and privileges, and to sell, convey, and transfer the same accordingly to the said mayor, aldermen, and citizens for the benefit of the inhabitants of the said city, or otherwise.

“And notice is also hereby given, that in the said Bill so to be applied for, powers will be inserted for the following purposes, or some of them; that is to say: To enable the said mayor, aldermen, and citizens to light, and to furnish a further and better supply of gas to the said city, and the several portions without the said city of the several parishes of St. Mary, otherwise St. Mary, Carlisle, St. Cuthbert, otherwise St. Cuthbert, Carlisle, and the parish of Stanwix, all in the county of Cumberland, and the liberties, precincts, and extra parochial places within the said city and parishes, or any of them (being the district comprised within the limits of the said Act incorporating the said Company), and for such purposes to enlarge and extend the present gasworks of the said Company, and to construct other gasworks, and to lay down mains and pipes and other apparatus in and through the streets, squares, courts, alleys, highways, lanes, roads, thoroughfares, and public pas-

sages and places within the limits of the said district; to enable the said mayor, aldermen, and citizens to receive and recover rents and charges for the supply of gas to the inhabitants, and for the public lights within the said district, and to purchase and hold lands and houses for the purposes to be authorized by the said Bill, and for other purposes, and to sell superfluous houses, lands, and works; to enable the said mayor, aldermen, and citizens to raise money on the credit of the gasworks to be so purchased or acquired and constructed by them, and of the corporate property and city fund and city rate of the said city, or of any of such securities, or on the bonds of the said mayor, aldermen, and citizens, or by all or any of such means; and to enable them to apply any part of the city fund for any of the purposes to be mentioned in the said Bill, and to confer upon the said mayor, aldermen, and citizens all or some of the powers of 'The Commissioners Clauses Act, 1847,' and of 'The Gasworks Clauses Act, 1847,' and all such other powers as may be deemed necessary for fully carrying into effect the several purposes mentioned in this notice.

"And notice is also hereby given, that in the said Bill so to be applied for, provisions will be inserted for better defining the boundaries of the district within the limits of the Act passed in the 44th year of the reign of His Majesty King George III., intituled 'An Act for lighting the streets, lanes, and other public passages and places within the city of Carlisle, in the county of Cumberland, and the suburbs of the said city, for paving the footpaths of the streets of the said city and suburbs, and for otherwise improving the said city,' and for other purposes connected therewith.

"And notice is also hereby given, that it is intended by the said Bill to repeal all exemptions, rights, and privileges by the said Act incorporating the said Company granted or reserved in respect of any precinct, liberty, or place within the said city and adjoining parishes, or any of them; or granted or reserved to any corporation or persons in respect thereof, or otherwise; and also to vary or extinguish all existing rights, privileges, and exemptions, which would in any way impede or interfere with any of the objects mentioned in this notice, or to be authorized by the said Bill, and to confer, vary, or extinguish other rights, privileges, or exemptions.

"And notice is also hereby given, that it is intended by the said Bill to dissolve the said Carlisle Gas Light and Coke Company, and to alter, amend, extend, and enlarge some of the powers and provisions of the said Act incorporating the said Company, or to repeal the said Act, and to grant other and further powers and provisions in lieu thereof; and also in cases where it may be deemed necessary so to do with reference to all or any of the objects and purposes mentioned in this notice, or to be provided for in the said Bill, to alter, amend, and extend, or repeal wholly or in part, some of the powers and provisions of the said Act passed in the 44th year of the reign of His Majesty King George III., and of the Act passed in the session of Parliament held in the 7th and 8th years of the reign of His Majesty King George the Fourth, intituled 'An Act for watching, regulating, and improving the city of Carlisle and the suburbs thereof,' or of either of the said Acts, or of any other Act relating to the said city or the environs thereof.—Dated this 31st day of October 1849.

"JOHN NANSON, *Town Clerk.*"

Abstract of Accounts laid before the Half-yearly General Meeting of the Carlisle Gas-Light and Coke Company—*continued*.

BALANCE SHEET.									
ASSETS.			LIABILITIES.						
Dr.			Cr.			£.	s.	d.	
Stock of fittings and rented meters	.	.	Owing by Company from general ledger	.	.	1,172	19	9	417 7 6
Owing to Company from ledgers, &c.	.	.	Cash due to Treasurer	.	.	1,060	8	9	1,921 3 1
Balance against Company	.	.		.	.	105	2	1	
						2,338	10	7	2,338 10 7
						£			£
PERMANENT ASSETS.									
Permanent assets, March 1849	.	.	Permanent assets, March 1849	.	.	£.	s.	d.	£.
Less balance against Company, March 1849	.	.	Extensions in mains, lamps, and services, March 1850	.	.	23,856	6	11	23,856 6 11
	.	.	Extensions in buildings and apparatus, per ledger	.	.	399	10	11	399 10 11
Balance added to capital, year March 1850	.	.		.	.	873	18	11	873 18 11
	.	.	Less balance against Company, March 1850	.	.	25,129	16	9	25,129 16 9
	.	.		.	.	105	2	1	105 2 1
						25,024	14	8	25,024 14 8
						£			£

Stock taken and accounts made up to the 18th March 1850..

We, the undersigned, appointed to audit the Company's accounts, do certify that the above are correct.

JOSEPH FORSTER.
WM. RICHARDSON.
JOS. HANNAH.

BURIAL GROUNDS.—The state and condition of the burial-grounds is set forth to be a grievance in the memorials, and the Corporation are anxious to have the power and means of providing a proper cemetery or cemeteries. Mr. Steel furnished the return here given, as to the number of interments and the areas of the respective burial-grounds, since 1828. The several incumbents also furnished statements, from which abstracts are given.

The *burial grounds* are six in number, and are all within the city. One is connected with the parish church of St. Mary's, another with St. Cuthbert's, one adjoins Christ Church, Botchergate, another adjoins Trinity Church, Caldewgate, the fifth is a burial ground belonging to the Society of Friends, and the sixth in connection with the Roman Catholic Chapel, which has been closed since Easter last.

DETAILED STATEMENT of BURIALS in the different CHURCHYARDS within the Boundaries of the CITY of CARLISLE.

Year.	St. Mary's.	St. Cuthbert's.	Trinity Church, Caldewgate	Christ Church, Botchergate.	Catholic Chapel.	Friends' Meeting-house.
1828	240	207	..	..	..	..
1829	295	200	..	..	..	..
1830	284	193	..	..	..	..
1831	242	149	..	43	..	..
1832	71	166	361	171	..	..
1833	52	177	279	154	..	..
1834	45	118	222	119	..	..
1835	34	129	194	133	..	..
1836	43	240	242	101	..	..
1837	57	175	297	154	..	..
1838	51	132	275	113	..	1
1839	53	75	203	92	..	1
1840	81	127	243	151	33	4
1841	85	110	223	164	31	1
1842	109	101	201	120	26	2
1843	102	87	187	108	19	7
1844	104	92	230	113	26	2
1845	107	100	149	136	32	2
1846	189	121	222	166	80	2
1847	194	151	295	236	80	7
1848	138	88	201	138	40	7
1849	..	..	221	..	9	2
	2,576	2,938	4,245	2,412	376	38

NOTE.—Christ Church, Botchergate, was first opened in 1831, and Trinity Church, Caldewgate, in 1832.

NAME of BURIAL-GROUND, their respective AREAS, and the NUMBER of INTERMENTS in each since 1828.

NAME OF BURIAL-GROUND.	Number of Deaths.	Net Area of Burial-ground in Square Yards.	REMARKS.
St. Mary's	2,576	3,246	Ground full
St. Cuthbert's . . .	2,938	3,132	, ,
Trinity Church . . .	4,245	5,230	, ,
Christ Church . . .	2,412	3,180	, ,
Catholic Chapel . .	376	525	, ,
Friends' Meeting-house	38	660	, ,
Total	12,585	15,973	

Few burials have been permitted in the interior of any of the churches for some years.

ABSTRACT OF REPLIES BY INCUMBENTS TO PRINTED QUERIES, &c.

Printed queries were issued to the several incumbents, as provided under the statute (12th and 13th Vict., cap. 3, secs. 9 and 11), in respect to intramural interments in the metropolis. These were duly signed and returned. The following extracts are taken from them.

“Trinity District Church in the parish of St. Mary; area of yard in which church stands, 5,230 square yards. Number of interments from 1842 to 1848, 1,484. The ground is open for use, and may serve for some years. My parishioners are generally cotton spinners and weavers; funerals generally take place at four o'clock in the afternoon. The clerk receives the orders for interments, and assists the sexton in selecting the sites. The incumbent keeps the register.

“TABLE OF FEES.

	s.	d.
“Clergyman's fee for funerals	0	5
Clerk's , , ,	1	7
Sexton's for digging a grave	1	6
Total	3	6

Fee for putting up a stone in church-yard 10 0

“There are no tablets put up in church.

“ (Signed) JAMES THWAYTES, *Incumbent.*”

“St. Mary in the parish of St. Mary, Carlisle, under the same roof as the cathedral. The burial ground is situated on the north side of the church and cathedral, with a small piece of ground to the west, adjoining but separated by a wall, and reserved by the Dean and Chapter for burials by their especial permission. Area of the whole ground 3,246 yards, of which the last named portion may be about 200 yards. Population of parish 7,005. Number of burials from 1842 to 1848,

943. Ground quite insufficient at present, and ought to be closed. It is enclosed on two sides by houses, and by cathedral and church on the remainder.

“TABLE OF FEES.

	s.	d.
“ Clergyman’s fee for funerals	0	5
Clerk’s ,, ,,	1	0
Sexton’s fee according to labour . . . . .	..	..

“Clerk or sexton receives orders. Sexton selects site. Register kept in iron safe in church.

“ (Signed) WILLIAM REES, *Incumbent.*”

“ St. Cuthbert’s in the parish of St. Cuthbert. There is a grave-yard in which the church stands; it is crowded offensively. The site is surrounded on all sides by houses: the ground is considerably above the level of the streets to the south. The ground ought to be closed, and an extramural cemetery be provided.

“ (Signed) JOHN FAWCETT, *Incumbent.*”

“ St. Michael’s Church, parish of Stanwix. Extent of ground about 6,700 square yards. Population of parish about 2,200. Number of interments from 1842 to 1848, 290. Have no suggestions to offer. Clerk receives orders for interments. Vicar selects sites and keeps register.

“TABLE OF FEES.

	Parishioner.			Non-Parishioner.		
	£.	s.	d.	£.	s.	d.
“ Vicar’s fee for interments	0	0	6	0	11	0
Clerk	0	1	0	0	5	0
Sexton	0	2	6	0	5	0
	<hr/>			<hr/>		
Total	0	4	0	1	1	0
	<hr/>			<hr/>		

Monuments in yard 0*l.* 10*s.* 0*d.* to Vicar.

Tablets in church . 5 5 0 ,,

“ (Signed) THOMAS WILKINSON, *Vicar.*”

“ Christ Church, parish of St. Cuthbert. There is a grave-yard in which the church stands; area about 3,180 square yards; population of parish about 6,000; number of interments from 1842 to 1848, 1,026. The ground is inconveniently crowded, and it is most desirable that means be forthwith adopted for providing an additional burial ground for the district. There are no monuments or tablets inside the church. The common fee for a burial is 3*s.* 6*d.*; for ground appropriated for one grave, 1*l.* 11*s.* 6*d.*; for two, 3*l.* 3*s.*; for three, 5*l.*: a charge of 5*s.* is made for laying down a grave-stone.

“ (Signed) JOHN FAWCETT.”

“ Upperby, a district chapelry separated from St. Cuthbert’s, Carlisle. A grave-yard in which the church stands; area about 1,400 square yards. Opened in 1846; number of interments up to 1848, 42:

cannot say how long the ground may last. The ground is quite detached from houses; it is above the level of the village, and is surrounded by a wall and hedge.

“TABLE OF FEES.

	Child.		Adult.	
	s.	d.	s.	d.
“ Clergymen	1	0	1	0
Clerk	1	6	1	6
Sexton	1	0	1	6
	<hr/>		<hr/>	
Total	3	6	4	0
	<hr/>		<hr/>	

“The clergyman receives orders, selects sites for burial, and also keeps register.

“Signed on behalf of himself and parochial officers,

“WILLIAM COCKETT.

“*From Curate of Upperby,* Carlisle.*”

VENTILATION.

This subject may be divided as under:—*Town, Street, and House Ventilation.*

Town Ventilation.—The ventilation of a town may be impeded, or facilitated, by its natural position; some of the conditions, such for instance as are the result of elevation, cannot be altered, but many natural features detrimental to health may be modified. Marshes and ill-cultivated undrained land affect the air injuriously; but if to these defects is added the refuse sewage, an atmosphere positively poisonous is engendered, and should this take place on that side of a town, intermediate betwixt west and south, from which points of the compass winds containing the most vapour blow, and which are also, in this country, the most frequent and constant, then the greatest amount of evil will take place, and sickness, especially severe during epidemics, will be one inevitable result. The most perfect drainage of a town will not remove the cause of this evil, but may actually add to it, if the whole sewage, containing the refuse of water-closets in solution, is thoughtlessly poured into stagnant ditches, or even made to flow, in undue quantities, over undrained land; neither can this refuse be turned into a river, brook, or other natural watercourse, but to the injury of some portion of the district. The only rule of true safety in dealing with this refuse is to apply it to its legitimate use, under proper conditions, namely, if as a fluid, by means of hose to well-drained land; or it may be solidified by deodorizing mixtures, and in this form be retained without injury for more distant use. Marsh land in the vicinity of any town may be

* Upperby is beyond the Corporation boundary of the city.

drained and improved with singular advantage, and poor agricultural land may also be most materially increased in value by deep draining. The fertility of the land may thus be increased, vegetable decomposition be arrested, fog and atmospheric damp will be diminished, and the temperature of the atmosphere raised from 6 to 10 degrees, which will be equivalent to a removal of so many miles south into a warmer climate. Carlisle is liable, from its situation in the valley of the Eden (as also from the close vicinity of the Caldew and Petteril) to damp fogs, and extensive land drainage would diminish these. Much has already been done, but more remains to be accomplished. It is a complex question, involving varied interests and rights, as those of the land-owners and others, all of whom must see their interest in works of further improvement before they can be fully accomplished. Modern science has, however, fully proved the fact that works of necessity are also works of profit, if they are carried out on true principles and with rigid economy. Land may be deep drained at a cost varying from four to six pounds sterling the acre, and even under unfavourable circumstances, the increased produce will repay the whole expenditure in three or four years. Instances have occurred where such outlay has been repaid in the first year, so that complete and perfect drainage of all the surrounding land will benefit the proprietors, as well as improve the general atmosphere of country and town. It must be by such means as have been briefly described that a town, externally, is to be properly ventilated, namely by a thorough deep draining of all adjoining land, and by a careful and systematic removal, or application of the town's refuse to agriculture.

Street Ventilation.—This question most intimately concerns the rate-payers and inhabitants generally. It is of serious importance to the wealthy, as also to every class who own house-property; but, connected with house ventilation, it is health or disease, life or death, to the working man and his family. No fact is more firmly established than the one which places foul air, and excess of epidemic, endemic, and contagious diseases, as cause and effect. Dr. Reid, in his full and most able Report, has stated the names of several streets, courts, yards, and lanes, where typhus, and other diseases of a similar type occur, and the description then given remains true of them to this day. The crowded state of certain portions of the city may be inferred from the plans furnished with this report, one of which exhibits a block of buildings, composed of hotels, shops, and dwelling-houses, in the centre of the city, extending from the town-hall, bounded by Fisher-street, down to the Friends' meeting-house on one side, and bounded by Scotch-street, down to Rosemary-lane on the other side.

The position of yards, privies, cesspools, middens, stables, hotels, shops, dwelling-houses, and covered passages, are delineated. The second plan shows that portion of the city bounded by Devonshire-street above, and Drover's-lane below ; Scotch-street, the market-place and English-street on the west, and Lowther-street on the east. This block of property consists of lanes, courts, and yards, banks, shops, hotels, stables, cow-sheds, schools, and dwelling-houses, amongst which are crowded and confined yards, privies, cesspools, middens, and other nuisances. Many of the privies and cesspools are in immediate contact with the dwelling-houses, some are within them, the cesspool and middens extending beneath the living or sleeping-room floors. Drainage is either absent or most imperfect, surface channels alone having been provided, not, however, with any view to refuse drainage, for this purpose they ought not to be used, but merely to convey away the rainfall. The general state of the sewers and drains are described in another portion of this Report. A great portion of the present crowded state of the buildings in the centre of the city is comparatively modern. Most of the confined lanes, yards, courts, and alleys, were, in the first instance, gardens attached to houses, fronting the main streets. These houses have gradually been changed from private dwellings into shops, hotels, taverns, stables, workshops, offices, and out-houses, until every available open space is now built upon. Power to check this undue crowding in future, if properly exercised, will be as valuable to the owners of property as to the inhabitants generally.

If the ventilation of a city or town can alone consist in wide streets, lanes, yards, courts, and open thoroughfares, then is the case of Carlisle hopeless, as more than half the city will have to be taken down ; but such wholesale alteration, or rather destruction of property, is not essentially necessary, and it may be incidentally remarked that there are few towns or cities of importance in England where thousands of pounds have not been expended in widening streets, rounding off corners, or lowering streets, some of which money would have been more beneficially laid out upon sanitary works, such as sewers and house-drains. These remarks are not intended as an argument against improvements, but against undue expenditure in this direction, to the entire neglect of that which is not unfrequently of much more importance, namely, the due improvement of the crowded dwellings of the poor. Wide streets, open courts, and spacious yards, are doubtless a great advantage ; but an uncontaminated atmosphere is of much greater importance, and by proper means of ventilation, this may be secured, even in a crowded yard or small room, where, without such means, it is absent in the wider street or larger room. The hold or fore-castle of a merchant

ship, in the centre of the Atlantic, is more vitiated and poisonous, if foul bilgewater is allowed to accumulate, and ventilation is neglected, than the worst cellar-dwelling in the most crowded town; as the fluid refuse of the bilge, which is equivalent to the cesspool on land, is, from the motion of the vessel, in constant agitation, and the whole atmosphere below decks is contaminated. The fresh atmosphere over an ocean, to the occupants of such a vessel, presents no amelioration to those confined below. The evil consists in retaining foul bilgewater; the remedy must be, a daily dilution and removal. This rule will also apply to the ventilation of streets; all refuse must be removed from the premises as soon as generated. Sewers, drains, and water-closets, can alone accomplish this, with a full water supply, and, as demonstrated by Mr. Edwin Chadwick, the whole should be under one local superintendence and management. The following remarks made by Dr. Farre and Mr. Grainger, in their recent most valuable Report to the General Board of Health on thirty-eight metropolitan workhouses, are so much to the purpose that I beg to transcribe them.

EXTRACT FROM REPORT BY DR. FARRE AND MR. GRAINGER.

“ *On Respiration, and the Nature and Amount of Atmospheric Deterioration resulting.*—It is in strict accordance with the results of experience to state, that of all the circumstances affecting the health and lives of human beings, and especially when collected in numbers together, by far the most potential are those relating to the quality of the atmosphere in which they habitually live. To breathe a pure air is more essential than to have a proper supply of food, fuel, or clothing; for although these last are, as they are termed, the chief necessities of life, it is less difficult for people to maintain a certain degree of bodily health on scanty food and with imperfect means of warmth, than it is for them to escape disease when they are immersed in a deteriorated atmosphere. Without dwelling upon the proofs of this position which might be so readily derived from the history of those great epidemic diseases, the plague, the yellow fever, and ague in all its forms and degrees, and which have long brought conviction to the minds of the most enlightened medical observers, touching the all-predominating influence of aerial agency—we would select a few illustrations from the experience afforded by the last winter in connexion with cholera.

“ The laws of a disease, like cholera, may in some respects be better studied when the epidemic is mild, and, as it were, selects the individuals and localities most obnoxious to attack; inasmuch as when the disease acquires all the force of which it is capable, when in fact it becomes a pestilence, it breaks through all barriers, and by the intensity of its poison invades persons and places of every class and description. Up to the present time it has fortunately happened that there have been in the metropolis only isolated and almost individual attacks, those only being selected who were from circumstances specially predisposed. Whenever anything like an outbreak has occurred, with two or three

exceptions, it is remarkable that these have taken place in public institutions, and especially in workhouses. Take for example the workhouse of the Holborn Union. In that establishment, as before stated, there were in the months of January and February 30 cases of cholera, of which 20 were fatal ; and yet the inmates were better fed, better clothed, and better warmed, than thousands of the out-door poor in the populous, and in many parts destitute district. They had meat three times a-week, suet pudding once, and pea-soup thrice, and yet several attacks of cholera took place among them at a time when, as we ascertained by express inquiry, there was not, and had not for a long time been, a single case from one end of the union to the other. In seeking to know how it came to pass that people having three meat dinners a week should be thus selected, whilst others in rags, and wanting daily food, should escape, the only one cause that could be assigned was that within the workhouse, the inmates were constantly immersed in a deteriorated atmosphere day and night.

“ A still more striking illustration of the same principle was afforded by a charitable institution, in which the inmates were provided with animal food almost daily, were well clad, in short, were in all respects amply provided for, yet amongst these young women a severe outbreak of cholera occurred ; a large number were attacked, and several died. There have been a few cases in the neighbourhood, but these were totally disproportioned to the numbers attacked within the walls of the institution ; the only sufficient cause for which, that could be discovered, being the close and confined character of the dormitories.

“ Such then is the vast importance of maintaining the purity of the air ; and we now would briefly state how it happens that a neglect of ventilation leads to such a noxious atmospheric deterioration when any considerable number of persons are collected together. It is well known, in a general way, that this is caused by the exhalations or secretions of the animal body, and essentially by those of the lungs and skin ; and if most persons were asked what was the most important element of the contaminated air of a crowded apartment, many, probably the majority, would reply, carbonic acid ; but this, in reference to the generation of the disease, is an error. Atmospheric deterioration, whether we speak of the air of cities or of the open country, depends on other matters than carbonic acid gas, though this in itself is at all times, when in any excess above the natural standard, injurious to health, and if sufficiently concentrated, a deadly poison. In the vapour which passes out of the lungs in the act of expiration or breath, as it is called, besides carbonic acid, there is a highly noxious animal matter, which, if it be collected by the condensation of the expired vapour, and kept for a few days, becomes decomposed, and emits a strong putrid odour ; and so again in the case of the skin, there is, without a moment's cessation, emitted a vapour, which though it be ordinarily invisible, can be made palpable to the senses by approaching the point of the finger to a polished mirror, and which, like the vapour from the lungs, contains effete, that is, decayed animal matter. That these substances are most noxious to the living body, will be immediately inferred from the fact, that one of the express and most important offices of the lungs and skin is to carry them out of the body. What, then, it must be asked, but the most injurious effects can be expected

from the re-introduction into the system, by the way of respiration, of substances for the discharge of which such careful provision is made by nature; which are indeed the very excreta of the animal frame? There is, in fact, no doubt that, although the air of cities does contain, as it has been experimentally proved, a somewhat larger proportion of carbonic acid than that of the country, the generation of disease, and especially of fever, that infallible gauge of a contaminated atmosphere, depends on the admixture of some such subtle organic matters as those above noticed.

“ There is a further point connected with this discharge of animal matter into the external atmosphere meriting notice, and it is this: owing to certain circumstances, which it is not necessary now to specify, such substances are in an especial manner taken up and retained by articles of clothing, and not less so by blankets, bedding, &c.; a circumstance proved by the well-known fact, that medical men and others, after visiting the wretched abodes of the poor, retain even for two or three days, in their clothes, the peculiar odour of the atmosphere of such localities. The same effect also is produced by visiting close and badly ventilated wards in workhouses, and in a still more marked degree, by even a brief sojourn in schools overcrowded with children. It will thus be immediately perceived, that although by freely opening the windows of the dormitories in the day time, the carbonic acid gas generated during the night may be carried off, it is not possible by such means to dislodge the poisoning organic matter of the respired air clinging to the bedding, and even to the floors and walls. The only effectual method of accomplishing this important object, whenever owing to defective arrangements such an impregnation has been allowed to take place, is by freely exposing the bedding to the external air daily, as is done with the hammocks on board of men-of-war. That such a thorough airing would cause extra trouble is true; but this in a workhouse, where the difficulty is to find useful employment, affords no valid objection to the suggestion here made.

“ It is necessary to point out, in connexion with this subject, that in several workhouses, as noticed in the special reports on each establishment, the staircase leading to the dormitories opens from the day-room, by means of which the foul and heated air readily ascends as by a duct; and although the windows in the dormitory may be sedulously kept open, the deposit of animal matter upon the beds is not thereby prevented. This is a most objectionable arrangement, and loudly calls for amendment, inasmuch as, besides the evil just noticed, there is no doubt the inmates must often, when they retire to bed, enter an impure atmosphere.

“ Few non-professional persons are aware of the vast activity of those pre-eminently vital processes, the circulation of the blood and respiration; nor of the intimate connexion existing between these and the production of the most destructive diseases; it is indeed very recently that even physiologists have attained to a full knowledge of the subject. The first writer who placed the facts as they were at that time ascertained in a prominent point of view, was Dr. Southwood Smith.* It may be stated, in ordinary breathing that there are about 20 respi-

* See *Philosophy of Health*, 1837, vol. ii., p. 84.

rations in a minute; that about 20 cubic inches enter the lungs at each inspiration, so that 400 cubic inches are given off from the lungs in a minute, which in the course of 24 hours will give the enormous quantity of 333 cubic feet, or about 40 hogsheads. Now, as the air which passes out of the lungs in expiration is contaminated, and ought never to be breathed a second time, and to secure this ought to be the end and aim of really efficient ventilation, the above is the measure of deterioration for each person. Again, as to the circulation, as it has been ascertained that the whole of the blood in the body completes its circuit in a time considerably less than two minutes; in fact, according to an eminent physiologist, in a time varying from $43\frac{3}{4}$ to $62\frac{2}{3}$ seconds;* it follows that in that brief interval it must also go through the lungs, and there be acted upon by the atmospheric air admitted into their interior. The actual quantity may be thus estimated; suppose the heart beats 72 times in a minute, that at each pulsation two ounces of blood goes to the lungs, and this is a very moderate calculation, then 144 ounces will circulate through the lungs in one minute; 8,640 ounces, or 720 pounds, in one hour; and 17,280 pounds, or 24 hogsheads and 4 gallons in the course of 24 hours.

“In order to comprehend the full significance of these facts, it must be understood further that the blood takes up with avidity all substances, even the most deadly poisons, when brought in contact with it in the form of a gas; it matters not whether the gaseous body is or is not adapted to support animal life, once presented to the blood it is absorbed. In this way it can be readily understood that any kind of noxious matter proceeding from the decomposition of animal and vegetable substances is greedily sucked up by and mingled with the blood, and with that fluid it rapidly circulates and reaches all parts of the body.”

HOUSE VENTILATION.—This should be especially provided for in the structural arrangement of all rooms, public and private; in workshops, places of public assembly, and, in fact, wherever human beings can possibly be brought to live or crowd together; it is of as much importance that arrangements are provided whereby the atmosphere shall be freely changed, as it is that such places should be enclosed and roofed. The fearful destruction of human life which took place in the black hole at Calcutta, or more recently on board the Irish steamboat, was not so much in consequence of over-crowding, as an

* Among other proofs of the extreme rapidity of the circulation, it will suffice to state that substances capable of being detected in the blood by chemical analysis, as the ferrocyanide of potassium, nitrate of barytes, &c., have been injected into the jugular vein of one side of the neck in the living horse, and have been detected in the jugular vein of the opposite side in from 20 to 30 seconds; and the same substances injected into the vein of the neck have been discovered in the great vein of the hind leg in 20 seconds. Now, in the first of these experiments, the blood following the course of the circulation must have passed from the one jugular vein to the right side of the heart, through the lungs, through the left cavities of the heart, through the great artery of the heart (the carotid), through the millions of vessels of the brain, and so to the jugular vein on the opposite side. In the second experiment, the track through which the blood must have passed was even more extensive, as it must have gone through the arteries and veins of the hind leg.

almost entire absence of the means of ventilation. The loss of life which is recorded to have taken place was due to a poisoned atmosphere producing suffocation. It was not the mere overcrowding which produced death, but defective ventilation. These are no doubt extreme cases, but they illustrate the worst conditions of the question. Any person who has visited the dwellings of the poor must have been struck with the foul condition of the atmosphere in some of their rooms. In common lodging-houses, and other such places, especially those rooms crowded by Irish vagrants, the atmosphere habitually breathed would produce fever, in a stranger to them, within a few hours; but so much has habit overcome nature, that the only industry some families exhibit about their rooms is to block up every crack and crevice which would admit fresh air. This can only arise from extreme ignorance on their part as to the fatal consequences of such a mistake, arising from the long-continued state of neglect in which they have been allowed to exist. It will be a recognized duty of the local Board to compel ventilation, as it now is of the parish authorities to maintain pauperism; as, in many instances, the latter is the offspring of the former. Means of efficient ventilation are not sufficiently secured by doors, windows, and fire-places, even where these exist. An ordinary-sized man consumes about 46,000 cubic inches of oxygen per day. Thirty human beings will, at times, voluntarily crowd a room not more than four yards square, or a cubic space of 32 yards, which is barely sufficient for the healthy respiration of ten persons. The common lodging-houses are at times most fearfully overcrowded.

It is a fact which cannot be too widely known, that a modern house, if even of a superior class, and built in what is termed "the best manner"; is about as injurious a place of residence as any man could devise. All the walls are solid; the specification described that they should be "well flushed, jointed, and perfectly grouted up;" the floors are formed with "narrow stove-dried boards, close jointed, and laid in the best manner;" the doors and windows are the perfection of workmanship, as, when closed, they will scarcely admit a breath of air; "the skirtings are of cement," the slates are "close pointed," the chimney openings are upon "the most recently improved principle," low; and the whole structure approaches as nearly as human ingenuity and "good workmanship" can make it, to the condition of an hermetically sealed bottle; and in these rooms wealthy human beings live and breathe; head-aches, it is true, are common, but they proceed from the "weather," or some cause beyond the reach of medicine. The door of such a room will vibrate with the in-draft like an *Æolian* harp. Perhaps one of the greatest

blessings which can befall a family is to get into what is termed "a slight and ill built home," in which it is impossible to block constant ventilation. But it will be far better to build from the commencement with this means in view. Dr. Arnott's valve is a simple and beneficial contrivance, and may be applied with advantage to old or existing houses, but it does not effect fully all that is required, as the ventilation is confined to one small opening. Means of admission for fresh air should be general and diffuse, the means for abstracting vitiated air the same; as the more diffuse the opening, the less perceptible will any draft be. An opening 12 inches square is not too much for an ordinary dining-room, but if it is made at one point, the draft would be excessive, and if two such are made, for ingress and egress, there would be a direct current from one to the other, leaving the air in the room on each side, comparatively undisturbed, as may be seen in many lakes where a river holds its course in a direct line across. In place of making one or two square openings, the sectional area should be lengthened out; for instance, an opening 96 feet in length, and one-eighth of an inch wide, would be equal to one of 12 inches square, and such a slit-like opening may be made all round the skirting below, and at the junction of the ceiling and the wall above. Hollow bricks will readily and cheaply place the means of effecting this under control; with such appliances rooms will be in a healthy condition at all times and seasons.

Dr. Arnott has stated---

"Aerial movements are to man what the constant gliding past of a clear river stream is to fishes which inhabit it; and as certainly as we should destroy the trout of a stream by confining them in a small portion of the watery element until it became a dirty puddle, so should we destroy or injure human beings when we too closely confine around them a portion of the aerial element."

In these remarks I have striven to explain the conditions which must be fulfilled to accomplish town, street and house ventilation. The works will not be facilitated by vain regrets over what may be termed past mistakes and blunders in parties not having allowed originally sufficient space to each habitation. It is shown that space, though highly important, and most desirable in laying out new streets or suburbs, is yet only a secondary consideration; as to improve the atmosphere of a district the land must be drained; to improve the atmosphere of a town, the streets, lanes, courts, yards, alleys, and houses must be drained and regularly cleansed; and to improve the atmosphere of rooms, they must each be thoroughly ventilated. As previously stated, to pull one-half of the old city down would not materially improve the remaining section if these works and conditions were neglected.

PROPOSED WORKS OF DRAINAGE.—It is not necessary that in
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this Report detailed estimates should be given for the drainage of the town, neither is it necessary to the application of the Act that any estimates should be given; but as your honourable Board wish your engineers to furnish the fullest information in their power, for the instruction and guidance of the ratepayers, I beg to offer the following remarks on the drainage of Carlisle, and to append such estimates as the means at my command have enabled me to draw up.

It has hitherto been the practice to construct large sewers and house-drains either of brickwork, hewn stone, or rubble masonry. These have been found costly and inefficient. They are costly on account of their large size, and this also tends to their inefficiency. It is, therefore, of the utmost importance that any new drainage works to be carried out in the city should be founded upon correct data, namely, an accurate survey, to a scale not less than 35 feet to the inch, with sections of the whole district. During my inquiry I was favoured with the practical experience of Mr. Nelson and Mr. Cowen, C.E., who have paid some attention to the subject. I have considered each of their propositions with some advantage.

In laying out the drainage works of a town three features or questions of primary importance present themselves for consideration: 1st, The unity or divisibility of the whole area to be dealt with. Shall they be made one, or be kept separate? 2nd, How to obtain the best fall for the whole, or each separate part? and, 3rdly, What point or points will be the most desirable for an outlet or outlets? The first question involves a knowledge of the volume of water to be passed off; and also of the number of houses and other buildings to be drained; this, coupled with the second question, will dictate the dimensions of the main drain or drains; and the third question then remains to be settled upon its own merits, taking care that it has due consideration in deciding as to the second question, namely, the best fall.

The city of Carlisle is peculiarly situated; and before the drainage area or areas can be definitively settled, the site must have due consideration, so that full advantage may be taken of the natural facilities which exist for passing off the mere surface water or rain-fall. This is more especially necessary here, because, from the position of the city and the adjoining grounds, the main outlet will necessarily be at times flooded by the waters of the Eden. At present this surface rain-fall does pass off into the Caldew, the Petteril, and the Eden. Although certain portions of the city lying low are liable to be flooded; not, however, so much on account of the rain-fall over the immediate district under consideration, as from the great rise in the several rivers which have their sources to the south and west in the Cumberland mountains. It will, therefore, be

quite clear, that no mere sewer or sewers, could remedy this evil. But it may be laid down as a rule, that sewers which are to receive the contents of house drainage should not also form portions of any natural water-course, liable to excess of flood water, such as those rivers named; and, therefore, the line of sewers for Carlisle should be independent of any natural watercourse. It will not be desirable to have duplicate sewers as proposed by the late Mr. George Stephenson, neither should new ones be adapted to the formula given by the old engineers and their followers, which are found, by practice and experiment, to be erroneous in operation, as false in theory. It has been ascertained by accurate experiments, extended over a period of 12 months, that, from an area of 950 acres, partly covered with buildings and streets, and partly unoccupied land, the greatest flow of water through the sewer which received it after twelve hours' continued heavy rain, was only a depth of 20 inches in a 4 ft. 6 in. barrel invert; whereas, according to formula laid down, it ought to have filled a drain 10 feet in diameter. The actual flow, however, was something less than one square inch of section to each acre drained.

In deciding upon the dimensions of mains there is the surface water, or rain-fall, to be considered; not, however, as to how the largest volume shall be concentrated and passed into them; there is also the house supply. This may be an ascertained volume, and can therefore the more readily be dealt with. The only serious consideration due to it will be the times of greatest draft from the water mains, as these, of course, will be the times of greatest flow. One portion of this question may, however, readily be decided; namely, the dimensions of the water-mains being known, with the pressure upon them, the dimensions of a sewer or drain to remove this water alone is a matter of easy calculation, as that which is intermittent in the one system will also be intermittent in the other, and in the same proportion.

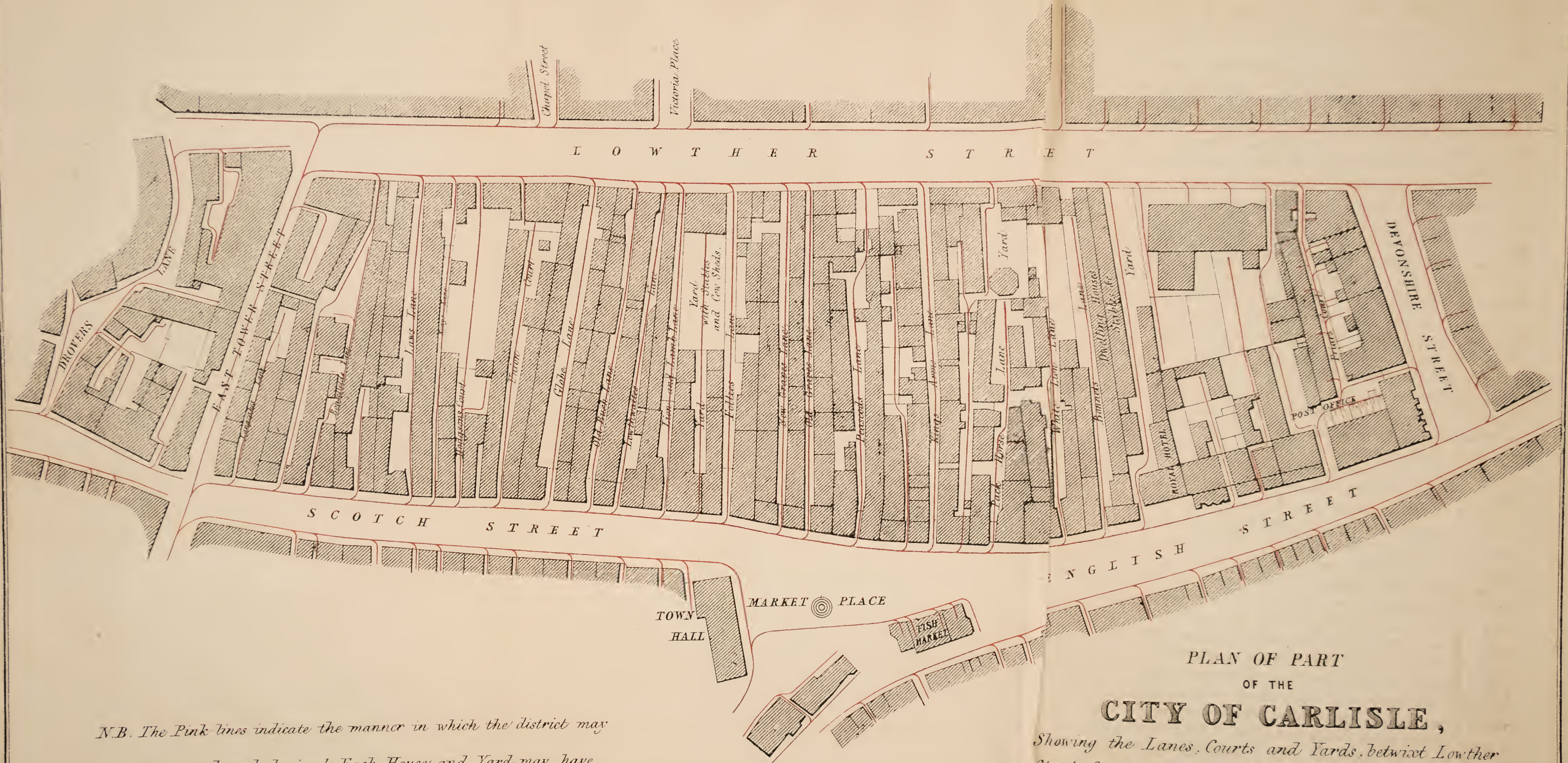
As previously stated, the necessary data are wanting for accuracy in dimensions of sewers, as for the furnishing of estimates; but certain broad facts can be stated which may serve as a guide to the local Board, and tend to prevent any gross mistake or error in setting out new works. A pipe 30 inches diameter, laid with an inclination of 1 in 150, will perfectly drain 200 acres of urban land, covered with houses, to the extent of 5,000, and each house having a water-supply equal to 100 gallons per day. Such a pipe-sewer, if kept constantly full at the head, would deliver 1,728,000 cube feet of water in 24 hours, or 10,800,000 gallons—a volume of water which would fill a reservoir 500 feet square, and seven feet deep; this, however, is presuming that such a pipe-sewer is continuous, the head kept full, and that there are no side inlets. But, at the outlet of such a sewer, if

it is left perfectly free, the water will not occupy in delivery one-half the area of the pipe; so that several branches of an equal capacity may be inserted before the sectional area of delivery is filled. The total number of houses to be drained, in Carlisle, is under 5,000, so that such a pipe would perfectly drain the whole city.

HOUSE DRAINAGE.—In treating this portion of the subject, there are other considerations than those of the mere dimensions of a tube necessary to remove the fluid refuse of any house, and experiment has fixed this at four inches. A tile-drain-pipe of four inches internal diameter will pass off the drainage of any one house in a few seconds of time, and therefore one such pipe may be made to drain several houses. If junctions are properly formed, a single four-inch pipe, laid at an inclination of 1 in 60, the head kept full, will pass 75 cube feet of water through it in one minute; and a four-inch pipe, inclined 1 in 240, and one-fourth full, discharges 150 cube feet per hour, which is above 40 times the daily supply of any house in Carlisle. It has also been ascertained that the same volume of water will more easily remove deposit through a four-inch pipe than through either a three-inch or six-inch pipe. It may, therefore, be taken for granted, that four inches will be the dimension best suited for house-drains in general. The dimensions of the secondary mains and branches must be matter of calculation, according to the area drained, and the numbers of houses connected. Drains four or six inches in diameter will be ample for all the cross-lanes, courts, and yards shown on the Lowther-street plan. The same observation also applies to the Fisher-street plan. Pink lines have been drawn on each of these plans, not, however, to dictate the actual line of any new drains, as accurate observation may discover many variations from those shown. The plans merely indicate the manner of drainage, and illustrate these general remarks.

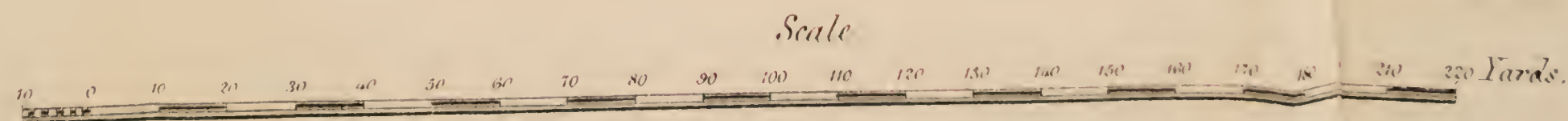
In laying the tubular drains especial care must be taken with the joints; there must not be any interruption to the free flow of water and sewage along the bottom of the pipes, as such projection may retain any solid passed into the pipe. The surface end of all drains should, however, be protected with a proper grate, and the last length of pipe may with advantage be slightly diminished or contracted, so as to make it quite impossible, even for the spirit of mischief, to pass any solid body into a pipe which shall block it below. All house, yard, and street drains may be trapped with a common bent pipe. The down spouts may pass direct into the drains, and be left open for ventilation; but if the drains and sewers are properly graduated, laid, and attended to, refuse will not remain in them, and the regular flow of sewage will take a current of air down with it.

CARLISLE.

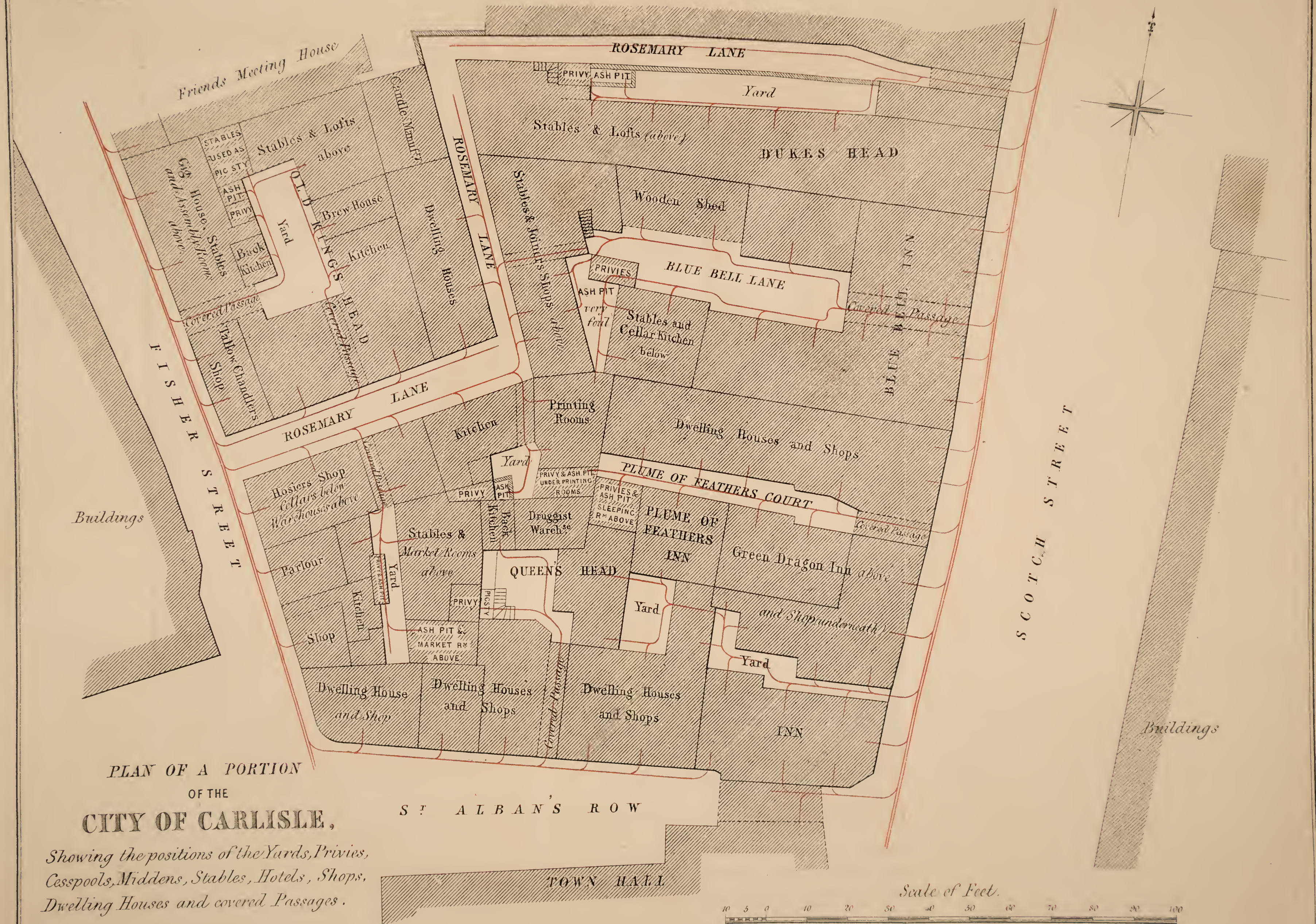


N.B. The Pink lines indicate the manner in which the district may be sewered and drained, Each House and Yard may have a properly trapped communication, but such branches are not shown.

PLAN OF PART
OF THE
CITY OF CARLISLE,
Showing the Lanes, Courts and Yards, betwixt Lowther
Street, Scotch Street, the Market Place and English Street,
Devonshire Street and Drovers Lane.



CARLISLE.



PLAN OF A PORTION
OF THE
CITY OF CARLISLE,

Showing the positions of the Yards, Privies,
Cesspools, Middens, Stables, Hotels, Shops,
Dwelling Houses and covered Passages.

N.B. There are no proper Sewers or Drains in the District.

The Pink Lines indicate the manner in which the District may be Sewered and Drained.

MATERIAL FOR SEWERS AND DRAINS.—The best material from which to construct the MAIN OUTLET sewer or sewers will also be matter for consideration. Earthenware tile pipes may be obtained of the required dimensions, but cast iron may prove, in several respects, preferable. This portion of the system must cross the Sorceries and Willowholme meadows, and consequently will be at times flooded many feet above the crown of the sewer, so that the use of brick will be quite out of the question, as any sewer formed either of brick or stone would inevitably be “blown” by such flooding. The probability is that cast iron will be the most desirable material to use here. For the secondary branches and house-drains, earthenware tile pipes will undoubtedly be the best as regards durability, utility, and economy. The form of pipe or tile is another matter for consideration. The outlet pipe may, with some advantage, be egg-shaped, but the whole of the secondary branches and drains will best serve their purpose, if circular. They will be made more cheaply, and may be laid more readily.

PUMPING SEWAGE.—At certain times, when the river Eden is swollen with floods the sewage may be pumped with great advantage, and the probability is, some arrangement may be made with the canal proprietors for the use of their engine for this purpose, should the local Board not treat with some person or persons to perform this work as part of a contract to convert the refuse into manure. This will remain to be settled by the local Board, upon the completion of the works of drainage.

ESTIMATE for PUBLIC SEWERS and DRAINS.

1,760 lineal yards of cast-iron main complete, 40s. .	£3,520
5,080 , , secondary mains, 10s. .	2,540
7,000 , , cross branches, 5s. .	1,750
Gulley-grates, side entrances, and traps .	500
Manure tanks complete	700
Total	<u>£10,010</u>

Capital 10,010*l.* at 7½ per cent., to pay the interest on capital, provide an annual fund to liquidate the debt in 30 years, as provided by the Act, and to maintain the works : : £750 15 0 *

This sum of 750*l.* 15*s.* will be reduced by the amount of income derivable from the sale of the refuse; but if the whole

* Private improvements are not estimated. They will consist of house and yard drains, sinks, water-closets, &c.; the amount required for which will, in each case, be governed by local peculiarities. The local board will, however, be competent to do this work, after furnishing an estimate to the owner or occupier, and giving the required notices.

sum is levied as a rate it will not amount to a rent charge, on cottages below 7*l.* a-year rental, of more than 2*s.* per annum, or $\frac{1}{2}$ *d.* per week each.

PUBLIC WALKS AND RECREATION GROUNDS.—There are no public recreation grounds provided and set apart for this especial purpose, but there are several pleasant public walks in the neighbourhood of Carlisle, some of which were formed or improved during the winters of 1818 and 1819, by the indigent poor. Voluntary contributions were raised for this purpose. One pleasant walk skirts the outside of the castle walls, in forming which several cannon balls were found. A favourite walk is across the bridge of the Eden, along Devonshire-terrace, to the village of Etterby, skirting Etterby Scar, a precipitous bank of the river. The city, with its cathedral, churches, castle, court houses, and public buildings, is seen to great advantage from this point, Skiddaw and the mountains of the west of Cumberland rising in the extreme distance. A winding descent leads to Hyssop Holme Well, a fine spring, which has been enclosed and arched by subscription, so as to form a commodious plunge bath. The view of the city and surrounding meadows, with the winding Eden, is very fine; the scene is rich and varied, affording mental food to the historian, the antiquary, and to the geologist.

The following account details the expenditure upon the public walks for the past year:—

PUBLIC WALKS, 1849.

Account of Receipts and Expenditure.

	£.	s.	d.
To cash received from subscribers	19	18	6
By balance due to Treasurer, 1848	0	4	0
By printing circulars, &c.	0	19	0
By postage stamps for circulars to subscribers	0	8	0
By Isaac Bell, wood, posts, &c.	0	10	3
By John Bulman, smith's work, 10 <i>s.</i> 6 <i>d.</i> and 3 <i>s.</i>	0	13	6
By John Rush, leading gravel *	5	7	6
By labourers' wages	8	11	6
By advertising in Carlisle Journal and Patriot	2	6	6
	<hr/>		
	19	0	3
	<hr/>		
Balance	0	18	3

(Signed)

JOHN WALDIE, *Treasurer.*

Examined and found correct.

(Signed)

WILLIAM STORDY.

JOS. RAILTON.

December 3, 1849.

* The gravel was given free of charge by Mr. John Andrew.

REMARKS.—Public walks may be maintained in good order, and the prospects from them may also be exceedingly pleasant to the sight, but to be agreeable and thoroughly healthy, all refuse and filth must be removed from their vicinity. Foul ditches, containing the festering accumulations sent into them from the town drains, are not only disagreeable to the sense of smell, but the gases given off into the surrounding atmosphere are highly injurious to health. The proper place for this material is the surface of the adjoining land, where it may be applied with singular advantage. Sewer refuse, in the liquid form, given as a top dressing by the hose and spreader, properly diluted and managed, is absorbed by the land and vegetation within one hour, so as not to leave any trace offensive either to sight or smell. The walk skirting the castle wall was, at the time of my visit, very much deteriorated by open ditches containing sewage refuse. The local committee complained of this state of things during Dr. Reid's inquiry. It was then stated—

“ That in the immediate vicinity of Carlisle there are no public gardens, parks, or grounds which may tend to the health of its inhabitants by affording them free space for exercise and amusement, except the public walks, of which there are several, and generally in airy and healthy situations. These are kept dry and in tolerably good order, by means of subscriptions raised from time to time for the purpose, and expended under the superintendence of a committee. It must, however, be stated that the salubrity of many of these walks cannot be otherwise than materially affected by the contiguity of pools and ditches of stagnant and offensive matter, as well as by open drains from different parts of the city, and by the filthy and indecent habits of individuals. Nor can your committee see any other probable means of remedying these defects than by the establishment of a complete common sewerage, and the affording to the authorities full powers to abate and remove all nuisances.”

Under the powers of the Public Health Act a complete system of sewerage may be laid down, and other necessary works may also be accomplished, which will place the means of decency within the reach of the poorest individual. The question of parks or recreation grounds I will not enter upon ; it will, no doubt, be dealt with by the Corporation with that liberal and benevolent spirit which for some time back has characterized their proceedings. Working men must have relaxation and amusement. Change is so essential to the body and mind that it is sought under the most disadvantageous circumstances, and frequently, for want of other and better means, is obtained on false and ruinous principles. The beer-house and dram-shop are resorted to because there is no inducement to enjoyment in the open air.

APPENDIX (A).

REPORT ON the DRAINAGE and SEWAGE of CARLISLE, by GEORGE STEPHENSON, Esq., C.E.

To the Mayor and Corporation of the Borough of Carlisle.

GENTLEMEN, Westminster, 17th November 1843.

IN compliance with your application to me some time ago, that I should give you my opinion as to the best mode of establishing a sewerage through the various streets of your city, I beg now to state that I have duly considered the subject referred to me, and submit to you the following observations:—

In considering the application of a system of sewerage to a city of the population and importance of Carlisle, it has been strongly impressed on my mind that a profit might be derived from the construction of the sewerage so as to convey all the nightsoil from the city into the main drains by pipes from the water-closets, and thence pass it into a reservoir or depository, to be removed and employed for manuring the land.

Of the value of such a plan, if it can be carried into effect consistently with the health and cleanliness of the city, I need scarcely here attempt to impress you; but I will at once direct your attention to the means that can be suggested for its operation.

Great care must be taken, that if the water-closets are constructed in the yards, they must be elevated as much above the level of the sewer as the convenience and nature of the locality will admit of, and if made in the interior of the buildings that they should be erected on the first floor or at a level considerably above that of the main culverts. A small reservoir or tank should be made at about the same level as the closets, where all the washings and slops of the house should be deposited for the purpose of carrying away the nightsoil into the main drain. The contents of the water-closets must thus be carried away by pipes communicating with the sewers, for many parts of the town are so very flat that the night-soil could not be carried off without elevating the closets and facilitating its passage into the main drain in the manner I have described.

If a superabundance of water had existed, it would not have been necessary to be so particular in the erection of the closets; and if water-works had been constructed it was my intention to have recommended the adoption of two sewers, the one for conveying away the night-soil and slops of the houses into a reservoir in the lowest situation that could be obtained for the purpose, and the other to carry off through surface gratings the floods of heavy rains. The first mentioned drain I should have proposed to lay down without any openings whatever, except from the water-closets, so that no unpleasant smell from the night-soil could possibly escape, except from the reservoir to which it would be ultimately conveyed, where I should have recommended a chimney to be adopted that the smell and effluvia might thus be carried off far above the level of the dwellings in the City.

It would, of course, be necessary that this reservoir should be closely covered in by arching of sufficient capacity to hold all the soil that might be there accumulated for a few months, when by means of a small dredging machine constructed within the chimney the contents of the sewerage might be sufficiently elevated as to run into close carts prepared for the purpose of carrying it away to be deposited on the lands as manure.

If this plan could be efficiently carried out, I am satisfied in my own mind that it is capable of yielding a very considerable profit, but as you have not a sufficient body of water at your command to meet my views for the adoption of such a plan of sewerage, I think it must be abandoned for the present, unless it be carried into effect in one district of the city, namely, from the Bush Inn to the meadows on the north side of the New-road, where the necessary facilities present themselves. The plan I propose might here be adopted at a moderate cost, by erecting a small engine, say of four or five horse power, at the highest summit of the town, where water may be obtained by sinking a well; the water here would, it is true, be hard, but a sufficient quantity might, I am persuaded, be procured to carry the plan for the preservation of the manure into effect. The flushing, as it is called, of the main drain for the purpose of carrying off the night-soil into the reservoir would only be requisite a few times in the year, when due notice could be given to the farmers in the neighbourhood that it might be conveyed away. This plan, it may be observed, would not admit of the rain-water, for during its way into the night-soil sewerage, as the quantity would then be too large, and would carry off the contents into the rivers, the rain-water would, therefore, require a distinct sewerage communicating with the streets by surface gratings.

There are so many considerations in this plan to recommend its adoption, that it is my opinion that there will be an Act of Parliament for enforcing some general plan similar to that I have described.

The Commission now appointed to consider the state of the dwellings and sewerage of populous towns in England will, doubtless, furnish the Government with suggestions, which will be very generally enforced; but some time may probably elapse before these instructions are issued; I proceed, therefore, at once to lay before you the different routes which the main sewers ought to take through your city, and to furnish you with a general drawing of the culvert which I would recommend you to lay down in the several localities. The Bush Inn being the highest summit of the town, I propose that a sewer be made along the centre of English-street, Scotch-street, and Rickergate, and so on to the meadow land on the other side of the New-road. The next course will be from the same summit, but in a contrary direction down Botchergate and Union-street, and terminating near the junction of the road from the latter street with the Brampton-road, which appears to be the lowest level in that direction. Another course of drain will be required down Henry-street, terminating at the same point as that last mentioned.

A fourth course should run down Lowther-street, thence down Drover's-lane, and communicate with the main sewer in Rickergate.

The next course of drainage must commence near the Fish-market, running along Castle-street and Finkle-street, and so on into the general

receiving cesspool in the meadow, and it will be found necessary to have one also down Fisher-street to join this at such a point as the lowest level may indicate.

Having thus described the course which the most important lines of sewerage should pursue, and furnished you with a drawing of a culvert of the best form and dimensions that can be adopted, I have put you in possession of sufficient information to enable you at once to commence your work, all the minor parts requiring drainage will suggest themselves as you proceed. You must, however, always provide that the main sewers shall be below the communication with the water-closets.

Every proprietor of a house adjoining the streets should be compelled to have a sufficient water-closet accommodation, and to have a direct communication between the closets and the main sewers by means of a pipe laid at such a declivity that nothing can lodge so as to cause an obstruction to the drainage.

The subject of the water-closets and their drainage in large towns requires much consideration, and, I believe, that an Act of Parliament will shortly be obtained to enforce every house to have a water-closet.

A great part of Carlisle is on very low flat ground, and should such a regulation be enforced, the water-closets ought to be erected either on the second story or be elevated so far from the ground as to give a rapid current to the washings and slops of the houses; these should all be collected in an open vessel a little above the level of the water-closets, they would thus be the means of keeping them clean.

It is very probable that the Commissioners will issue designs for the erection of water-closets, with the order for their public adoption. I would, therefore, recommend you to commence the construction of the main sewers, and to leave the details of the water-closets until the Commissioners shall have published their Report,

(Signed)

GEO. STEPHENSON.

REMARKS ON MR. STEPHENSON'S REPORT.

In the Report, which I have had the honour to draw up, on the present state and condition of the city of Carlisle, I have set forth certain rules for town, street, and house-drains, as also for their ventilation. Duplicate sewers and drains will not be required, and those which are to be laid down, should, in action, pass freely the liquid and solid refuse sent into them. Water-closets may be placed at any elevation, on the ground floor, or otherwise, if the tube drain has a fall not less than one in sixty. Sewers and drains, cannot, with advantage, be made places of deposit. Waterworks have been established, and many improvements have been made in drains and water-closets since Mr. Stephenson drew up his Report, which however contained suggestions highly valuable at the time it was written.

ROBERT RAWLINSON.

APPENDIX (B.)

In recommending the example of the "*Society for Improving the Condition of the Labouring Classes*" to the consideration of the Corporation of Carlisle, I would beg to remark that public sanitary works, with the most perfect police and other regulations, will alone tend very little to the health, comfort, or improvement of those most requiring such beneficial change. Public works and general public regulations may actually be productive of much evil, and even reach to persecution and oppression. Such is at this moment the case in certain towns and places where cellar dwellings have been closed by hundreds, and the wretched poor have been ejected by thousands, without any the slightest provision having been made for their more comfortable and healthy accommodation. They have, however, been told by some of those who have enforced the law, "Well, this is what sanitary reformers and sanitary reform has done for you." New streets and new houses cannot be regulated by an Act, their erection cannot be enforced; but the Society here quoted may be taken as an example, showing how much good may be accomplished. And I would respectfully urge that compulsory powers to regulate property should be exercised with due moderation. At once to shut up all the common lodging-houses in Carlisle, or to clear out all objectionable dwellings, would not, abstractedly, be a benefit, but the contrary. It has been shown by the Society that the poor and wretched are not hopelessly enamoured of vice and filth when they have a way of escape provided, but this they cannot of themselves attain. Proper houses and homes must be the work of those above them in means and wealth. As shown by Lord Ashley, "example" will accomplish much of this. Let there be lodgings provided where each adult can have a separate bed, and all the comforts of a separate home, at the same price now paid for part of a bed in a crowded room; and the general accommodation must rise up to this standard, and persons of superior class and character will enter into competition with the present degraded proprietors of such places, who are little, if at all, removed from the worst occupants of their rooms.

The present police expenditure is principally required to control and keep in order the dwellers in crowded room tenements and common lodging-houses. It is in these places that all the worst passions develop themselves, and break out in their most violent forms; and, as shown in this Report, it is in such places that disease and poverty is most rife. As stated by the relieving officer of Dover—"From amongst the occupants of such places those are found to proceed, who oscillate throughout their lives betwixt the workhouse and the gaol."

The remarks of Lord John Russell are in every way worthy of deep and serious consideration, as it is quite true that sanitary works generally may be carried out, and yet the poor be left in a worse condition than they were before. Those forming the bulk of the population must have means of health, comfort, and decency, or there will

be no true progress made, or any permanent safety for the whole of society.

“ *Society for Improving the Condition of the Labouring Classes.*—At a meeting of the friends of this Society, in St. Martin’s Hall, Long-acre, the body of the building was nearly filled, a considerable number of ladies being among the audience. On the platform were Lord John Russell, the Marquis of Westminster, the Earl of Harrowby, Lord Ashley, Earl Waldegrave, Viscount Ebrington, Lord Robert Grosvenor, Sir H. Verney, M.P., Mr. Pusey, M.P., &c.

“ The proceedings were opened by the Rev. Mr. Auriol, of St. Dunstan’s, with prayer.

“ *Lord John Russell*, on taking the chair, said—‘ Ladies and Gentlemen—This Society is the beginning of a great change, which is of the utmost importance to this country. In the villages and rural parts of this kingdom it is to be observed that the proprietors have in many quarters learnt to turn their attention to the dwellings of the labouring classes. They have perceived the evils which have resulted from the crowding of their dwellings, and they have taken steps which will be of the utmost importance, not only in immediately promoting the comfort and welfare of the labouring men and their families who have to live in these cottages, but indirectly, by tending to promote many other good works, such as the purity and decency of the domestic relations, attendance on Divine worship, and the religion and morality of conduct of the great mass of the people of this country. In large towns those objects can hardly be left to individual proprietors, and can hardly be successfully accomplished by their independent efforts. It is therefore an object of the utmost importance that there should be a Society which should turn its attention to this subject, and which, by exhibiting what can be done to improve the dwellings of the labouring classes, will seek to obtain for them benefits they have not hitherto enjoyed. As civilization goes on, we have not only the advantages but the evils of civilization; and, unless we exert ourselves to counteract those evils among the people—the greatest of which is their overcrowding in insufficient dwellings—unless we exert ourselves from time to time to counteract those evils, our boasted civilization, instead of promoting religion, instead of promoting morality, instead of promoting obedience to the laws, will tend to leave a great class of the population without sufficient means either for the comforts they ought to have, or for religious instruction, and thus place them in the state of the worst parts of less civilized society.’

“ The *Earl of Harrowby* observed that, having paid considerable attention to the working of the allotment system, he was happy to say that the objections which the farmers had raised to it at first were silenced wherever they had had an opportunity of seeing its effects. The farmers had urged that if their labourers got small pieces of land they would neglect their work, give less labour, and use their allotments to hide the thefts from their employers’ ricks and corn fields. Once the system was established all those complaints were silenced, and it was generally acknowledged the farmers obtained better and more efficient labour in consequence. The Society had by its efforts given to the labouring classes dwellings replete with comforts and conveniences with which the wealthier classes were not acquainted till a few years

ago. What an advantage to have such a Society at work, enlisting in the service of the dwellings of the poor every new discovery of science in the domestic economy of life and in the preservation of health! Proprietors of property and dwelling houses might learn from this society what improvements they could make in the abodes of the poor at a very small outlay. Notwithstanding all that had been done, he could not but hope to see a still more extended rise in the scale of comfort among the labouring poor; and the great advantage from the Society was, not what it did itself, but the stimulus it gave to the efforts of others. Half the good that might be done was neglected, not because people would not do it, but because it did not occur to them to think of it. The distribution of the little sketches produced by the disinterested labour and ingenuity of their excellent architect, Mr. Roberts, had caused the most excellent effects; and, instead of having to go to some country builder or architect for plans to improve his property, any landlord could now write up to the Society's officers and have the results of the thought and consideration of the most experienced persons. The effect was patent in the various associations which had sprung up in towns all over the country. The investigations to which the calamity of the cholera had given rise had taught us that we best discharged our duty, not only to the poor but to ourselves, by doing all we could for the improvement of the dwellings of the poor. It was idle to expect peace, virtue, or godliness, when the labouring classes were huddled together in such indiscriminate filth and confusion. Let persons visit those abodes of misery, and they would see how the absence of all comfort and of any reasonable recreation gave rise to habits of intoxication and drunkenness. He confessed that all feelings of anger (if any such feeling could cross his mind) were lost in those of compassion and sympathy for the poor creatures who were driven to the beershop and public-house as a refuge from their own wretched homes. 'This question must be taken up very shortly.' Let us imitate the ancients, who had officers to look after the construction and management of their great cities. We must provide width of streets, abundance of water, thorough ventilation, open spaces for recreation for the working classes, and give them every possible amusement and wholesome and innocent relaxation, and make their homes cheerful and cleanly. Some of the so-called improvements going on in large towns were perhaps the greatest evils to the poor. The opening of new communications and fine thoroughfares must not be considered as of unmitigated good. In passing through that part of Westminster where the open clearance had been made through the Broadway for the great thoroughfare from the Abbey to the district of Belgrave-square, he had asked of one well acquainted with the habits of the people, 'Where are the people gone to who have lived here?' and the reply was, 'Oh! they are all crowded into the back streets: they have gone into the houses with others, so that there are now two where there was only one before.' He was glad to have an opportunity of stating these facts in the presence of the noble lord, who took a deep interest in the affairs of the country he was called on to administer; and he called on the Legislature, when they interfered by Act of Parliament with private property in order to effect those great clearances, to make stipulations that there should be dwellings built on sound sanitary principles in the rear, to which the poor people could go when turned

out of their abodes. When they were giving authority to pull down those houses, why not stipulate that something like the model lodging-houses should be built in their place? They could secure a certain kind of accommodation for the labouring classes whom those improvements were displacing. He hoped the Society, which had stirred up the public mind on the subject, would receive the support and assistance its operations so deservedly called for.

“The *Rev. Mr. Champneys* said he represented there the large and populous district of Whitechapel, of which he was incumbent. He bore his testimony to the great need there was for such a Society as this. Many then present might be ignorant of the character of the common lodging-houses in East London, and he would therefore endeavour to place before the meeting an account of the average state of those lodging-houses, into which artisans and country labourers and others, reduced by their misfortunes rather than their faults, were put. On entering them, the visitor first passed into the common room, the average size of which was 18 feet by 16, the height of the ceiling usually being eight feet. Some were smaller and some larger than this, which might be taken as a fair average. In this room there were generally packed, especially on wet days, or late in the evening, 20, 40, 60, or 80, and in one instance that he knew of, though that was a larger room, 150 persons. There they took their meals, washed, sat, smoked, gambled with cards or otherwise, and there those who had no means of obtaining a private room carried on their work. The tongues of the inmates of course were not silent, and much moral mischief was constantly going on. Young men with a little smattering of knowledge, who had read a few infidel books, and were therefore anxious to make a display of their own powers, immediately attacked all who entered; and the meeting would readily understand the effect of conversation in these common rooms, where respectable persons who had seen better days were present, or when, as was frequently the case, children heard all that passed. The sleeping apartments were even more crowded than the common room. Yet when these wretched habitations were visited by persons who came there on missions of charity and Christian benevolence, they were treated with great respect. He recollected being once called to administer the sacrament of the Lord’s Supper to a Manchester man, who, with his wife and child, had been taken ill in a lodging-house in his parish. He found in a small room sixteen beds all crowded together to such an extent that it was impossible for him to kneel between the bed on which the dying man laid and that next to it. The room was filled with people, and it was impossible for him, without outraging the feelings of the meeting, to describe the state of that apartment, or to convey an adequate idea of what those endured who were obliged to live in such an atmosphere. In the common lodging-houses no classification was adopted, no inquiry was made as to character, but simply whether the applicant could pay. He had frequently pointed out to the keepers of those houses the objections to the system, but the answer was, ‘I wish I could get a great many more.’ The rooms had in many instances only a single window, and the atmosphere was so vitiated that, if the foul air were coloured in one way and the pure oxygen in another, no one who understood the necessity of the latter for health would venture to put his head into the apartments where these unfortunate people were

compelled to live. He believed that intemperance among the humbler classes might be traced to the state of physical depression and exhaustion into which they sink from breathing this vitiated atmosphere. While such physical evils existed it was next to hopeless to think of effecting anything by moral means. He could mention cases in which persons placed in such situations had been rescued from the influences around them by the exertions of Scripture readers and others; but the contaminating associations of such scenes were so great, that unless the people frequenting them could be separated and dispersed, and unless the pure light and air of Heaven were let in, no improvement could be effected. His conviction was that a Society like this was not only calculated to exercise a great and beneficial influence upon the humbler classes brought within the scope of its operations, but that the whole character of the labouring population would be raised by the competition thus created in securing comfortable house accommodation. He could bear testimony to the truth of what had been stated by the Earl of Harrowby as to the opening of new streets, for when a large street was cut through one of the worst localities in his parish the inhabitants of the place had to pay from 6*d.* to 2*s.* a-week more for more crowded or inferior lodgings, or they had to go to St. Pancras or elsewhere at a great distance from their ordinary work. He concluded by expressing the great importance which he attached to the working of the Society, and by stating that he would esteem it one of the greatest boons that could be conferred on his parish if the Society enabled him to take a house where the principles on which it acted in providing accommodation to the working classes should be practically exemplified.

“*Lord Ashley* said, the resolution he had to move was grounded on the feeling of thankfulness to which he had alluded, and called on the meeting to acknowledge the exertions of the Bishop of London and of his clergy for the collections made on the day of General Thanksgiving, while approving of the design of building dwellings for the poor as a memorial of deliverance from the cholera. The Society appealed to the meeting and the public to enable them to carry into effect that great object, and by means of a movement of an universal and extensive character to do something for the benefit of the poor of the metropolis, which, by their example, would be extended to thousands of their fellow men all over the empire. He rejoiced to tell them he had received communications from France, Belgium, Holland, and even America, stating the necessities under which the people laboured, and that this country was greatly in advance of them, and asking for instruction and assistance from the larger experience of the Society. He held that this was a noble position for the country to hold, and he entreated them as patriots and good citizens to give the Society their assistance in carrying out so large and comprehensive a scheme for the amelioration of the whole human race. He expressed his admiration of the contemplated plan for constructing a model lodging-house for from 100 to 200 people at the rate of 1*s.* a-week. The Society would thereby not only confer a benefit on those whom it received within these walls, but it would set an example to be imitated over the length and breadth of the metropolis. There would be baths and washhouses provided, and yet the whole establishment would be self-supporting. The buildings of the Society might be the result of charitable and kind feelings, but they

were not charitable or eleemosynary in their character. They were maintained by the people, who were thus enabled to preserve unimpaired the spirit of honest independence. The wealthier classes provided the capital which labourers could not supply; but having done so, they left to the working man the duty of maintaining the habitation so provided for him. These institutions did not place the working man in a position of independence; they enabled him to turn to account his wages and receipts, and to develop his physical, moral, and intellectual resources. One of the great advantages of such Societies was that they set an example for good men to imitate, and from which bad men could not shrink. In proof of this he would mention that near where they were then assembled the Society had obtained a large house adapted for its purposes, which was let at a very moderate rent, as compared with the charges for the most disgusting accommodation in the same neighbourhood. The inspector of that house was, a short time after it had been opened, met by the proprietor of a lodging-house over the way, who addressed him thus—‘You abominable fellow, you’ll be the ruin of me. Since you opened I have been obliged to spend 400*l.*, for no one after seeing your place will come into mine.’ That certainly would be the result when the tastes of the working people improved. Their tastes had been degraded only because they had been compelled to live in the midst of so much filth and discomfort, from which no powers of their own could rescue them. He quoted the case of Church-lane as an example of the evil consequences of opening fine new streets through previously wretched localities without providing for the accommodation of the poor so displaced. Four years ago Church-lane was in an overcrowded state, but since then, and mainly in consequence of the new streets opened up in that vicinity, the previous population had been doubled. He hoped that when the whole of this subject was reviewed in its length and breadth that some legislative provision would be made on this subject. It was ascertained that water could be supplied to every dwelling in the metropolis—water in as large quantities as could be wanted—for $\frac{3}{4}$ *d.* or 1*d.* a-week per house. He hoped that a prohibitory clause would be introduced into all the building Acts, preventing the construction of houses, even for the poorest of the poor, unless they had within them everything requisite for health and decency; above all, however, unless they had a due provision of water. He was quite sure that the condition of the labouring classes lay at the root of many of the miseries that beset the country; and that unless their condition was amended, all hope was useless and every other effort in vain. He was sure that nothing could so tend to the harmony of all states and conditions of men—could so bind man to man and keep this country at peace with herself, thus rendering government an easy task—as that their noble chairman, holding the great position of First Minister of the Crown with so much honour to himself and benefit to the country, should continue to place himself at the head of such a movement as this. Under such circumstances they might all rejoice in the title of Protection, for they were Protectionists of what related to the welfare of the human race, of the Throne of the Queen, and of all that was dear to them.

“The Report read by the Secretary represented the rapid progress of the Society during the last year, which was attributed to its practical character. It then surveyed the results which the Society’s efforts had

achieved in the encouragement of the cottage allotment system, and of improved dwellings for the labouring classes. In the first department the Society's views had been taken up and carried out very extensively by private benevolence; in the second, great exertions had been made, and plans of model lodging-houses had been proposed by the honorary architect of the Society. The Report anticipated as much as 9 and 10 per cent. on the capital invested, while the rent charged would be sufficiently moderate. It appeared from the balance sheet that the gross annual rental from the four existing establishments of the Society amounted to 1,504*l.*, and that, deducting general and local taxes, the expenses of superior residence, &c., there was a return of 4 per cent. on the land, and 6½ per cent. on the buildings, fittings, and furniture. Some deductions must be made on the ground of repair; but the Society had as yet acquired no experience of the outlay requisite for this purpose. The Report concluded by stating that the Society's efforts being of an experimental character, had been attended by more than ordinary difficulty; but the interest taken in the condition of the labouring classes had increased, and was still increasing. In the other great cities and towns of the United Kingdom similar efforts had been set on foot for the benefit of these classes, and in the metropolis several districts had imitated the example set by the Society. If such exertions were continued, the Report anticipated results the hope of which appeared chimerical some years ago, viz., a permanent improvement in the condition of the labouring classes.



THE ROYAL SOCIETY OF HEALTH

Founded 1876

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